A crisis in student loans? How changes in the characteristics of borrowers and in the institutions they attended contributed to rising loan defaults

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A Crisis in Student Loans? How Changes in the Characteristics of Borrowers and in the Institutions they Attended Contributed to Rising Loan Defaults

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This paper examines the rise in student loan delinquency and default drawing on a unique set of administrative data on federal student borrowing, matched to earnings records from de-identified tax records. Most of the increase in default is associated with the rise in the number of borrowers at for-profit schools and, to a lesser extent, 2-year institutions and certain other non-selective institutions, whose students historically composed only a small share of borrowers. These non-traditional borrowers were drawn from lower income families, attended institutions with relatively weak educational outcomes, and experienced poor labor market outcomes after leaving school. In contrast, default rates among borrowers attending most 4-year public and non-profit private institutions and graduate borrowers—borrowers who represent the vast majority of the federal loan portfolio—have remained low, despite the severe recession and their relatively high loan balances. Their higher earnings, low rates of unemployment, and greater family resources appear to have enabled them to avoid adverse loan outcomes even during times of hardship. Decomposition analysis indicates that changes in characteristics of borrowers and the institutions they attended are associated with much of the doubling in default rates between 2000 and 2011. Changes in the type of schools attended, debt burdens, and labor market outcomes of non-traditional borrowers at for-profit and 2-year colleges explain the largest share.

JEL Classification: D14, E24, I23, G28, H52, H81

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I.   Introduction

Between 2000 and 2014, the total volume of outstanding federal student debt nearly quadrupled to surpass $1.1 trillion, the number of student loan borrowers more than doubled to 42 million, and default rates among recent student loan borrowers rose to their highest levels in twenty years. This increase in debt and default and more widespread concern about the effects of student loan debt on young Americans' lives has contributed to a belief that there is a crisis in student loans. Using new administrative data sources, we examine recent changes in the market for federal student loans with a particular focus on the sources of rising default rates, the roles played by educational institutions and the labor market outcomes of borrowers.

These data show that to the extent there is a crisis, it is concentrated among borrowers from for-profit schools and, to a lesser extent, 2-year institutions. We refer to these borrowers as "non-traditional" because historically there were relatively few for-profit students and because 2-year students rarely borrowed. As a result, these borrowers represented a small share of all federal student loan borrowers and an even smaller share of loan balances. However, during and soon after the recession the number of non-traditional borrowers grew to represent half of all borrowers. With poor labor market outcomes, few family resources, and high debt burdens relative to their earnings, default rates skyrocketed. Of all students who left school and who started to repay federal loans in 2011 and who had fallen into default by 2013, 70 percent were non-traditional borrowers.[1] In contrast, the majority of undergraduate and graduate borrowers from 4-year public and private (non-profit) institutions, or "traditional borrowers" experience strong labor market outcomes and low rates of default, despite having the largest loan balances and facing the severe headwinds of the recent recession. While the number of traditional borrowers also increased over time, recent borrowers' family backgrounds and labor market outcomes are not much different from their peers' in earlier years, especially for graduate students and undergraduates at relatively selective institutions. In fact, traditional borrowers earned more, on average, in 2013 than their peers had in 2002. While more recent graduates were hit harder by the recession, the unemployment rate of traditional borrowers who left school and started repaying their loans in 2011 was 7.7 percent in 2013 compared to 6.6 percent for the comparable cohort of recent borrowers in 2002.

These results derive from a new database formed by the merger of administrative records on student loan burdens to earnings information from de-identified tax records. These data provide annual information on student characteristics, the institutions they attended, loan balances and loan status from 1970 to 2014, and labor-market outcomes from 1999 to 2013 for a 4 percent sample of all federal student

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[1] Borrowers from non-selective 4-year schools accounted for an additional 12 percent of defaults.

borrowers. The sample includes about 46 million annual observations on 4 million individual borrowers, assembled from hundreds of millions of individual records of loan transactions, aid applications, and earnings records. These data were assembled to improve budget estimates and inform policy regarding programs with both spending and tax components. These linked administrative data also provide unique advantages over prior survey and credit-panel data sets because they allow detailed examination of the role of institutions, labor market outcomes and other potential contributing factors to student loan defaults.[2]

These data show that the number of non-traditional borrowers increased steadily since the mid-1990s as enrollment in for-profit institutions increased, and then surged during the recession as the weak labor market encouraged many to return to school, and to borrow to do so. Because of the relatively short enrollment durations of many new borrowers, the combination of new enrollment and rapid turnover resulted in a flood of non-traditional borrowers out of school and into loan repayment after the recession that was disproportionate to their share of enrollment. For instance, while for-profit students were only 9 percent of students (according to NCES) and 25 percent of active federal borrowers in 2011, they represented more than 31 percent of borrowers leaving school and starting to repay federal loans that year. Combined with students from 2-year institutions, who represented an additional 16 percent of borrowers starting to repay loans that year, this meant that almost half of borrowers in their first years of repayment were non-traditional borrowers.

In addition to being more numerous and in their earliest years of loan repayment after the recession, non-traditional borrowers appear to be a particularly vulnerable and high-risk population, which helps to explain their divergent outcomes. They tend to be older when they first enroll, to be from lower-income families, and to live in poorer neighborhoods. They are more likely to be first-generation borrowers. They attend programs they are less likely to complete and, post enrollment, are more likely to live in or near poverty and to experience weak labor market outcomes, outcomes that worsened disproportionately during the recession. And their loan burdens, though smaller on average both in absolute terms and relative to their earnings, have tended to increase faster over time.

All these factors contribute to their high default rates: about 21 percent of non-traditional borrowers required to start repayment on loans in 2011 defaulted within two years, compared to 8 percent among traditional undergraduate borrowers, and 2 percent among graduate borrowers. Many more appear to struggle with their loans but have avoided default through protections such as forbearance, deferment, and income-based repayment programs, which allow borrowers to suspend or make reduced payments

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[2] Detailed tabulations of this database are described in the appendix and available online.

during times of hardship. Using decomposition analysis, we find that changes in observable characteristics—like the backgrounds of students, their labor market outcomes, and the schools they attend—explain approximately two thirds of this increase in default, with changes in the types of institutions attended alone explaining between one third and half the increase in default rates between 2000 and 2011. The high rates of default among some borrowers combined with the sheer volume of higher-risk students starting to repay their loans explains most of the increase in default rates.

These high rates of default are unlikely to persist because of the recent normalization in enrollment patterns post-recession, increased scrutiny and policing of for-profit institutions, and other factors that have contributed to a decline in the number of non-traditional borrowers. From 2010 to 2014, the number of new borrowers at for-profit schools fell by 44 percent and by 19 percent at 2-year institutions. Because of the relatively long "life cycle" of a student loan—a loan originated to a first-time borrower today will not be "eligible" for default until the student completes their educational career, enters a six month grace period, and then spends about a year in repayment on the loan—these changes will not be fully felt for several years. In addition, rising enrollment in income-based repayment programs will help many borrowers experiencing economic hardships avoid default. The decline in the rate of new borrowers and an uptick in the number of borrowers paying off loans have already contributed to a sharp slowdown in the growth rate of borrowers and aggregate debt. In 2014, the number of borrowers increased by 1 million, down from an average of 2 million from 2009-12.

One key reason traditional student loan borrowers have avoided default and delinquency is that they experience favorable labor market outcomes, with very low rates of non-employment (even in the recession) and relatively high earnings, and are more likely to come from higher-income families in the first place. Most traditional borrowers have not accumulated large balances. While average debt burdens have increased and some borrowers have accumulated very large balances (4 percent of borrowers had balances over $100,000 and 14 percent had balances over $50,000 in 2014), most borrowers with large balances are graduate students, parents, and "independent" undergraduate borrowers, largely at for-profit schools. Indeed, one consequence of these patterns is that borrowers in the top 20 percent of the income distribution owe more than one-third of outstanding student loan debt.

Beyond examining the sources of the rise in default and delinquency, these data also inform a broader debate regarding the economic implications of rising student indebtedness. One concern is that rising rates of delinquency reflect excessive borrowing and overextended finances, which could impair students' abilities to finance first homes and to live independently of their families, or could constrain their occupational choices, reducing rates of homeownership and marriage, or entrepreneurial risk taking (Baum (2015), Bleemer, Brown, Lee, and van der Klaauw (2014), Field (2014), Gicheva (2013),

Gicheva and Thompson (2014), Ionescu (2009), Ionescu (2011), Marx and Turner (2015), Mezza, Sommer, and Sherlund (2014), Shao (2014).) If, instead, a shift toward riskier borrowers with weaker labor market prospects is driving rising default rates, then it may be less surprising that student loan borrowers are less likely to be homeowners or to be constrained in their occupational choices. In fact, rising default rates among such borrowers could be overshadowing relatively beneficial investments in higher education, which may be less worrisome or even desirable (Akers and Chingos (2014), Avery and Turner (2012), Dynarksi and Kreisman (2013), Sun and Yannelis (2014).) Indeed, for most borrowers (and the majority of the student loan portfolio) the education investments financed with their loans are associated with favorable economic outcomes, and borrowers are able to repay their debt even during recessionary periods. The statistics on federal loan borrowers illustrate trends in the characteristics of borrowers, the institutions they attend, and their educational and labor market outcomes that provide a surprisingly different view of educational outcomes than is provided by common survey measures or published statistics.

Our analysis does not address many other important questions. For instance, we do not examine what caused the run-up in student debt. Parsing out the relative contributions of the recession's effects on enrollment, households' savings, and ability to borrow elsewhere, contraction in public support for education, rising costs of attendance, and other factors would help identify whether steep increases in debt were transitory or likely to continue, and what the implications are for students' outcomes and for the returns on their educational investments. Similarly, we do not examine what can be done to address the problems facing existing borrowers and how to improve outcomes in the future. The Department of Education, state educational agencies, and other stakeholders have already implemented significant changes to borrowing and repayment programs to address many current challenges. However, absent continued reforms, many borrowers, particularly non-traditional borrowers, seem likely to continue to face systematic difficulties in the loan market.

The remainder of this paper is organized as follows. Section 2 provides background on the structure of federal student loan programs. Section 3 discusses the data source used in the paper. Section 4 analyzes the factors associated with the increase in student loan debt, and discusses the rise of non-traditional borrowers and implications for borrowing, default and labor market outcomes of borrowers. Section 5 provides an analysis of the characteristics of non-traditional borrowers and their backgrounds. Section 6 provides information on the labor market outcomes of borrowers. Section 7 analyzes the debt burdens of borrowers over time. Section 8 focuses on a key outcome, loan repayment and conducts regression and decomposition analysis of factors associated with the rise in student loan default. Section 9 focuses on additional factors associated with repayment outcomes, and focuses on the income distribution of

borrowers and borrowers with large balances. Section 10 discusses the flows of borrowers during and after the Great Recession as well as potential implications for repayment in the future. Section 11 concludes and provides suggestions for further research.

II.   Background: The Structure of Federal Student Loan Programs

The analysis in this paper focuses on federal student lending programs first established in 1958 to provide low-cost loans to students and subsequently expanded several times, notably under the Higher Education Act of 1965. These federal student lending programs accounted for the nation's largest source of non-mortgage household debt in 2014.[3] The aim of these student loan programs was to alleviate credit constraints, for borrowers who internalize many of the benefits of education.[4][5]

The vast majority of student loans in the United States are federally guaranteed or direct loans made by the Department of Education (2014b).[6] The main federal lending program today is the Federal Direct Loan program, which was created by the Higher Education Amendments of 1992. Since 2010 the Direct Loan program accounts for all federal student loans. Under this program, postsecondary institutions originate loans under federal lending rules, and loan servicing is handled by the Department of Education through private servicing contractors.

Direct Loans can be made both to undergraduate and graduate students, and there are four types of loans: Unsubsidized Stafford, Subsidized Stafford, PLUS, and consolidation loans. Unsubsidized, PLUS and consolidation loans are available to all borrowers attending eligible institutions, while Subsidized loans are available based on a financial needs test. One main difference between Unsubsidized and Subsidized loans is that interest does not accrue for borrowers of Subsidized loans while they are in school. PLUS loans are available to the parents of dependent undergraduate students, graduate students, and professional students. Independent undergraduate students are not eligible for PLUS loans but are allowed to borrow additional Stafford loans up to higher maximums. Consolidation loans allow students

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[3] The Department of Education provides more information on federal student lending programs.

[4] This stands in contrast to many other countries, where governments finance education expenses. The welfare implications of direct government financing of college costs are controversial, as while there are externalities associated with education, borrowers internalize many of the benefits of higher education. For a discussion of financing higher education see Hartman (1972), Johnson (2006) and Psacharopoulos and Papakonstantinou (2005).

[5] Lyndon B. Johnson, see "Remarks After a Meeting With Representatives of the American Bankers Association in Connection With the Student Loan Program" "*Under this new loan program, families will finance college education for their children in the same way that they finance the purchase of a home: through long-term, federally guaranteed private loans. For millions of families, the financial burden of college education will now be lifted; new opportunities will open for American students.*"

[6] Private student loans, which are not included in these data, are a small portion of total student loans, amounting to less than a tenth of all student loans disbursed between 2009 and 2013 (The College Board (2013)).

to combine all of their federal loans into one loan to simplify payments. Loan limits are set by legislation and loans can be used only to meet education expenses like tuition and other costs of attendance. Fees for Direct Loans were raised slightly following the 2013 budget sequestration: borrowers are charged an origination fee of 1 percent for Stafford Loans and 4 percent for PLUS loans.

Table 1 provides an overview of these federal borrowing programs. The table presents the total loan balance in each fiscal year, which adds up to $1.1 trillion in 2014, the total number of borrowers (42.8 million in 2014), and disaggregates those figures into the shares of loans and borrower types each year. Over time, graduate loans and Parent PLUS loans have increased as a share of federal lending. In 1994, about 68 percent of the portfolio was undergraduate loans. In 2014, about 59 percent of the portfolio was undergraduate loans. In terms of numbers of borrowers, the same growth in graduate and parent loans is apparent. However, much of the increase in graduate debt is held by a rising share of students taking out both graduate and undergraduate loans. The persistence of borrowing at the undergraduate and graduate level, and the increases in graduate and parent loans (whose loan amounts are limited only by costs of attendance), prove to be important reasons why aggregate and per-student loan amounts increase over time.

Prior to the Federal Direct Loan Program, the Federal Family Education Loan (FFEL) program also disbursed federally guaranteed loans through private lenders following lending rules for federally guaranteed loans. The main difference between the programs was financing through private capital or direct federal funds, and students saw few differences in lending rules.[7] The Perkins loan program provides additional loans to low-income borrowers with exceptional financial need. Perkins loans are a small share of federal student loan programs. The analysis in this paper excludes Perkins loans.

Interest rates are set by Congress and were identical for Stafford borrowers under the Direct Loan and FFEL programs, but can vary for graduate and undergraduate borrowers. Historically, undergraduate Stafford loan interest rates have been both fixed and variable, and rates have varied between 8.25 percent (1999) and 3.4 percent (2004). In the 2010-11 academic year interest rates were 6.8 percent; in 2015, they dropped to 4.25 percent.

For most loans, after leaving school, repayment begins after a six-month grace period. Once repayment begins, payment can be stopped through either deferment of forbearance. Loans can go into deferment if a borrower re-enrolls in school, becomes unemployed (for up to 3 years), faces economic hardship, or

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[7] The rules are almost identical for Direct Loans and FFEL loans, the main difference being that the source of funds is private under the FFEL program. Interest rates for parent PLUS loans differed slightly in some years, as did eligibility for income based repayment plans and loan consolidation.

joins the military or the Peace Corps. Forbearance also allows borrowers to defer loans for up to one year if they are ill, face financial hardship or perform national service. Interest continues to accrue under forbearance.[8]

The standard repayment plan for student loans is a ten-year plan. Extended repayment plans of up to 25 years are also available to many borrowers with large balances. In addition, income-based and income-contingent repayment options are available to many borrowers with low incomes and high relative debt burdens. Historically take-up of income-driven repayment plans has been low, although they have been rising in recent years. Chapman (1997) and Chapman (2006) provide a discussion of many of the theoretical issues related to income contingent repayment plans as well as an overview of income contingent repayment plans in an international context.

Under Income Based Repayment and Pay As You Earn plans, borrowers pay the lesser of 10-15 percent of their income or their payment under a 10 year plan. Under the Income Contingent Repayment plan borrowers pay the lesser of 20 percent of their discretionary income or what they would pay under a fixed repayment plan. In many cases borrowers can pay more under an income contingent plan as opposed to the standard plan. Eligibility for these programs has varied historically depending on the type of loan, time of entry into borrowing, entry into repayment, and debt-income ratios. In 2014 the Pay As You Earn plan was made available to all borrowers regardless of entry into borrowing.

III.   New Administrative Data Sources

The estimates presented in the paper derive from a random 4 percent sample of federal student loan borrowers assembled from components of the National Student Loan Data System (NSLDS), which is the primary data system used to administer the federal loan programs described above. This system maintains the information needed to operationalize the loan system: assessing eligibility for loans using information from financial aid applications; disbursing loans to institutions based on the students' academic level; tracking when students withdraw or graduate to determine when they must begin repayment, and if and when they enter deferment, forbearance, or alternative repayment plans; and providing the financial accounting of loan balances, interest accrual, transactions, and other changes in loan status. Hundreds of individual pieces of information contained in multiple databases, drawn from hundreds of millions of individual records of aid applications, loan transactions, and status updates are distilled into about 46 million annual observations on 4 million borrowers.

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[8] The Department of Education provides further information on repayment plans, forbearance, and deferment.

The panel, which follows the same borrowers over time starting from when they first take out a federal student loan, is based on data originally constructed by the Department of Education's Budget Service Division for use in budget projections. These files include information on student characteristics derived from each Free Application for Federal Student Aid (FAFSA) filed by students, information on each loan disbursed by Federal Student Aid (FSA) including the loan balance, its status and changes in status over time, the institution the loan was disbursed to, and information on Pell grants received. Information on the borrower from the FAFSA is generally only available for loans originated after FY 1995. However, most of the basic loan information (such as loan amounts and dates of origination, repayment, and default; institution of study) is available from all sample borrowers starting in FY 1969.[9] The sample is representative of more than 99 percent of federal loans and borrowers. However, while we include Parent PLUS loans in our tabulations of borrowing amounts, when examining the experiences of borrowers as they complete school, enter the labor market, and begin repaying their loans, we focus exclusively on students and exclude outcomes (and economic status) of parent borrowers.

These data are merged to a panel of administrative earnings and income records that span the (calendar year) period from 1999-2014 (data for 2014 are incomplete and preliminary). The primary data of interest are the earnings and total income of borrowers. Individual earnings are derived from information reports from employers (W2s) and from self-employment earnings reported on Schedule C of individual tax returns. Total income is the sum of all income sources reported by taxpayers, which, if the taxpayer is married, may include income and earnings of the spouse. In addition, information on filing status and the number of dependent children and federal poverty levels is used to construct indicators of poverty.[10]

Sample Construction

In order to examine the dynamics of borrowing in the loan market, we focus specifically on flows of borrowers as they enter borrowing (when they originate their first federal loan) and when they enter repayment (when they start repaying all of their loans), and the relationship of those flows to the overall stock of federal loans and to aggregate student-loan outcomes. We make the year a loan entered into repayment a primary focus because it is typically the first time a student exits school, enters the labor market, is required to make payments, and first becomes liable for delinquency and default.

In our construction of the person-level database, we define entrants as first-time borrowers, assign them to entry cohorts based on the fiscal year their first loans were originated, and use information on the

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[9] The sample does not include Perkins loans, which were approximately 1 percent of loans disbursed in 2014 (College Board 2014).
[10] Appendix A provides additional detail on the data, sample and variable construction.

students from the first loan-related FAFSA filed and the institution to which the loan was originated. This provides a consistent measure of new originations and borrower characteristics when they first enter the loan system. However, it does obscure the fact that an educational career sometimes involves multiple spells of borrowing (re-entry) as students take time off, change institutions, or go to graduate school. In addition, the fact that spells of borrowing may overlap at the end of the sample period introduces censoring effects; for instance, some borrowers entering repayment in 2014 will subsequently return to graduate school.

We define "entering repayment" as when a borrower's last loan enters into repayment (i.e. when all of a borrower's loans are in repayment) and define repayment cohorts based on the fiscal year a loan entered repayment. Again, borrowers may enter repayment on different loans at different points in time, such as when they attend graduate school. In practice, this definition tends to closely approximate commonly used statistics by the Department of Education and the performance of individual loans is highly correlated. Indeed, the aggregate measures of debt, default, and average loan burdens closely match those produced by the Department of Education (2014b).

Variable Construction

In general, most variables used in our analysis are straightforward: characteristics of borrowers, like family income, age, gender, are taken directly from the first FAFSA filed. Data on the neighborhoods of borrowers—local unemployment rates, poverty rates, median household income, and percent black, white, and Hispanic, are derived by matching the zip code provided on the first FAFSA with zip-code-level statistics from the 2000 Decennial Census. Loan information, such as disbursements and balances, are the sum of all Direct and FFEL undergraduate and graduate loans or Parent PLUS loans at the end of the fiscal year for each borrower. We use these loan types and the reported academic level of borrowers to differentiate undergraduate from graduate borrowers.

In practice, over the course of an educational career, students may attend multiple institutions and take out both undergraduate and graduate loans. Classifying students based on where they started borrowing at school (and whether they started borrowing as undergraduate or graduate students) thus presents important issues of interpretation. For instance, if more persistent, better prepared, or more talented borrowers complete more school or continue into graduate school, or if some institutions are better at retaining students or at encouraging transfers from 2-year schools to 4-year schools or from 4-year schools to graduate schools, classifying borrowers based on their ex-post outcomes is likely to introduce a form of selection bias that mechanically makes certain types of borrowers and institutions look better or worse. For example, consider an institution that is successful at getting its undergraduate students into excellent medical programs. An assessment based on where students last attended would attribute the

successful outcomes of the institutions' future doctors to the medical programs rather than to the institution itself.

As a result, our general approach is to classify students based on their characteristics, the institution they attended, and their level of school when they borrow for the first time. Hence, borrowers may be classified as attending a 2-year school even though some may ultimately complete a 4-year degree elsewhere, and borrowers who start their educations (and student loan borrowing) at 4-year institutions may ultimately go on to graduate or professional schools. One implication of this choice is that when we examine the eventual loan burden of a student starting to repay their loans, their loan burden may include a combination of undergraduate and graduate loans even though they started off as an undergraduate borrower. In practice, this assumption has little effect on the overall results because changes in enrollment between sectors are relatively rate. For example, a borrower attending a 4-year institution is generally likely to complete their education there.

One important advantage of these data over other sources is the availability of information on the institutions students borrowed to attend, including the specific school, the control (e.g. public, private, for-profit) and type (2-year or 4-year). To illustrate the importance of changes in the institutions students attend, we present much of our analysis based on the type of institution attended. In particular, we use a common index of selectivity from Barron's to segment institutions based on their control (public, private non-profit, and private for-profit), type (2-year or less or 4-year) and selectivity into six broad groups: non-selective for-profit institutions; 2-year public and private institutions (the vast majority of this category are community colleges); non-selective 4-year public and private institutions (Barron's "Non-Competitive or Less-Competitive", which admit more than 85 percent of applicants); somewhat selective ("Competitive"); selective ("Very, Highly, and Most Competitive"); and graduate-only borrowers (borrowers whose first and only loans were graduate loans) (Barron's 2008).[11]

Regarding loan outcomes, we focus on student loan defaults as our primary indicator of student loan distress. We define the default rate as the fraction of borrowers entering repayment in a fiscal year who are in default on a federal loan in that year or the subsequent two years (the three-year cohort default rate). We provide or introduce several other indicators of student loan burdens or distress including debt-service-to-earnings ratios and rates of negative amortization, which we define as the fraction of student loan borrowers who owe more on their loans two years after the year they entered repayment.

These estimates of the aggregate loan volume, number of borrowers, and the two-year cohort default rate closely mirror the official measures produced by the Department of Education. Figure 1 shows default

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[11] The data appendix also replicates all of this analysis by control and type.

rates over time in our sample, using aggregate statistics released by the Department of Education.[12] The replicated 2-year cohort default rate closely matches the pattern of published statistics for most of the overlapping period. However, our replication clearly differs slightly for several reasons that relate to our sample construction and to the construction of the official default rate. First, our sample is a person-by-year sample, which means a student appears only once, rather than multiple times in official statistics, if attending multiple institutions. Second, we focus specifically on the last time a borrower enters repayment, for instance, if a borrower has previously entered and exited an undergraduate program, for instance. This is likely to result in a higher rate of default than estimated in the official method because some borrowers quickly enter in-school deferment if they re-enroll. Finally, our sample includes all institutions and all (non-parent) borrowers, which likely is a broader array of programs and students than is counted in the official rate.

IV.   The Rise of Non-Traditional Borrowing and Its Consequences

New borrowers at for-profit schools, 2-year institutions, and other non-selective institutions

A primary focus of our analysis is on the divergent outcomes of what we call non-traditional and traditional borrowers. We define traditional borrowers as borrowers attending 4-year public and private institutions because these borrowers represent one type of a "typical" college student: they start college in their late teens soon after completing high school, are dependent on their parents (or assumed to be) for aid purposes, pursue 4-year degrees and, frequently, head on to graduate study. The median age of first-time undergraduate borrowers at these schools is 19 (26 for graduate borrowers) and more than 80 percent of undergraduates at relatively selective institutions are dependents for purposes of financial aid.

A primary reason we call them "traditional" is that historically such borrowers represented most borrowers and most loan dollars. In 1999, borrowers at 4-year public and private institutions and graduate-only borrowers represented about 70 percent of new borrowers, about two thirds of all federal student loan borrowers (the stock), and over 80 percent of aggregate student loans outstanding. One reason for the outsized influence of 4-year public and private institutions is that these institutions, particularly the most selective private institutions and graduate professional schools, were relatively more expensive, hence students there had a greater need to borrow to attend. The fact that in the United States institutional cost and quality are correlated is one of the reasons why there is a positive association between the amount borrowed and income, as will be discussed in detail later in the paper.

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[12] We use two-year cohort default rates for this validation exercise since historical data on this series exists for a longer period of time.

Although we refer in this paper to "non-traditional" borrowers as a group, non-traditional borrowers are non-traditional for differing reasons. One shared characteristic is that as of the late 1990s, they comprised only a small share of federal student loan borrowers and an even smaller share of the aggregate student loan portfolio. Focusing on undergraduate enrollment at degree granting institutions, students at for-profit schools were a relatively small share of new students in 2000 (10 percent) and an even smaller share of total enrollment (3 percent). While almost all for-profit students take out federal loans to study, their relatively small share of enrollment meant that they still represented only 20 percent of new borrowers, about one quarter of actively enrolled borrowers, and 15 percent of outstanding federal loans. Hence, they were a relatively small share of students, and of student-loan dollars, though a disproportionate (but still modest) share of borrowers.

While 2-year borrowers—primarily community college students—are also a small share of federal borrowers and loan amounts, the reason is quite different. Community college students rarely borrow and when they do, they borrow relatively small amounts. In 2000, community college *students* were 27 percent of new fall enrollment and 43 percent of total postsecondary enrollment—more than double the enrollment share of private non-profit institutions and almost fifteen times the reported enrollment of the for-profit sector. However, according to the Department of Education, in the 2000/01 school year, only 15 percent of new 2-year public students borrowed.[13] As a result, they were only about 9 percent of active undergraduate federal borrowers in 2000, and, because their average loan burdens are much smaller than for other students, about 4 percent of undergraduate federal loan originations that year, and 5 percent of all outstanding federal loans.

More generally, these non-traditional borrowers are more likely to be older at entry. The median age at first borrowing is 24 at for-profit schools and 23 at 2-year institutions. These borrowers are more likely to be independent for financial aid purposes and are both more likely to be without financial support from parents and also eligible to borrow more. While the characteristics of the students themselves are therefore relatively similar at for-profit and community colleges, the share that leave with loans and the average loan burden is much lower among community college students.

Of course, categories based solely on an institution's ownership or control and the predominant type of degree awarded miss some heterogeneity within and across each group. One particular grey area is the rising number of borrowers from certain non-selective 4-year public and private institutions, who share many of the same characteristics of for-profit institutions in terms of rates of financial aid receipt, poor

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[13]In 2012/13 the borrowing rate among community college students increased to 27 percent. This compared to half of 4-year public students in 2012/13, 62 percent of 4-year private students, and 77 percent of for-profit students. (IPEDS 2015, Table 331.20).

labor market outcomes, and high rates of default and delinquency, and who are unconventional in other dimensions, such as having a predominate focus on online education. In our analysis, we provide estimates of the outcomes of non-selective 4-year public and private institutions separately to illustrate changes within that borrowing population.

Panel A of Figure 2 provides more perspective on the rise (and decline) of borrowing by institution type by using estimates of the number of first-time borrowers at each type of institution each fiscal year. This figure shows the steady growth of the for-profit sector over the last 15 years and, especially, the surge in enrollment during the recession. In 2009 and 2010, borrowers at for-profit schools represented 30 percent of new borrowers (about 980,000 new borrowers each year), and new borrowers at 2-year schools represented 16 percent of new borrowers (and 19 percent at its peak in 2012 of 580,000 borrowers). Between 2006 and their respective peaks, the number of new borrowers at 2-year schools jumped by 71 percent, and by 60 percent at for-profit schools. While new borrowing also increased at public and private 4-year institutions during the recession, the increases from 2006 to their relative peaks were much smaller: 31 percent at non-selective schools (2011 peak), 12 percent at the most selective (2011), and 24 percent among graduate-only borrowers (2009). From 2009 to 2011, almost half of all new federal borrowers (45 percent) were students at either for-profit or 2-year schools.

Comparison of Enrollment and Borrowing in NCES and NSLDS

The increase in and importance of non-traditional borrowers is less visible in official statistics that report the level of enrollment or new enrollment (e.g. first-time, full-time fall enrollment, in degree-granting programs etc.). Because borrowers enroll for much shorter durations at 2-year institutions and 4-year for-profit institutions than at other 4-year institutions, the annual level of enrollment undercounts the number of individual borrowers flowing through for-profit and community colleges. Table 2 provides a basic comparison of entry flows and enrollment in NCES data (the primary public source for measuring college enrollment) for undergraduate students and compares those to estimates of the number of new and active undergraduate borrowers and the amount they borrowed from NSLDS. The measures are disaggregated by school type available in NCES: public 2-year, public 4-year, private non-profit and for-profit, and compares the levels and shares of students and borrowers in 2000 and 2011. The first two columns show first-time, full-time undergraduate enrollment. The next columns show total fall enrollment at degree-granting institutions, followed by the number of first-time students who take out federal student loans, and the number of total active borrowers taking out loans that year. The last two columns show federal undergraduate loan originations. The figure illustrates both the challenges in measuring student loan borrowing using different data sources and the differences in the intensity of borrowing across institution types.

As Table 2 shows, enrollment at for-profits increased from 3 percent of students to 9 percent between 2000 and 2011.[14] New enrollment of first-years increased from 27 percent to 28 percent at 2-year public schools, while the share of active borrowers jumped from 9 percent to 17 percent.

As Panel C of Table 2 shows, the enrollment figures considerably understate the number of new borrowers and active borrowers, particularly in the for-profit sector. Indeed, the number of new borrowers from for-profit schools exceeds the number of new full-time, full-year students reported in NCES each year, and the number of active borrowers exceeds the number of fall enrollees, which includes part time and full time students. Several factors are likely to explain this discrepancy, including borrowers in non-degree programs and borrowers enrolled outside of the traditional academic cycle.

The fact that new borrowing exceeds new enrollment at for-profit institutions, and that the ratio increased so rapidly among 2-year public students, and increased rapidly relative to the number of active borrowers is also important because it indicates that the level of churn through such institutions increased. As a result, for a given level of enrollment, there were a disproportionately large number of new borrowers being produced.[15]

Another observation is of the large differences in the intensity of borrowing across institutions and how it changed. While 2-year public borrowers borrow much less, their intensity increased rapidly over the 11-year period. In the for-profit section, the intensity of borrowing per recorded enrolled student is much higher than in other sectors.[16]

Implications for the Stock of Borrowers and Debt

As a result of the inflow of these new borrowers, the stock of outstanding debt and the borrowers both increased in size and changed in composition. Table 3 shows the number of outstanding student loan borrowers from 1985 to 2014 by the type of institution they first attended. In 2000, borrowers from for-profit and 2-year institutions accounted for less than 33 percent of all borrowers. By 2014, the number of borrowers more than doubled at for-profit schools and 2-year institutions, rising by 130 and 165 percent, respectively. The number of borrowers at selective public and private institutions increased by much less—about 65 percent. Almost half of the increase in the number of borrowers from 2000 to 2014

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[14]This is an underestimate since the NCES data only includes degree-granting institutions, defined as those that grant associate's or higher degrees and participate in Title IV federal financial aid programs. Many for-profits grant only certificates.

[15] For example, compare a scenario in which there are one million new borrowers each year and two million students each year to a scenario in which there is the same level of enrollment—two million students—but two million new borrowers each year. In the latter case, each year there must be twice as many students exiting into the labor market with student loans.

[16] This table only includes federal undergraduate loan volume and excludes Pell Grants and other federal loans.

(when the number of borrowers increased by almost 21.7 million) were borrowers from for-profit institutions (29 percent) and 2-year institutions (15 percent). By 2014, almost 40 percent of all federal borrowers were non-traditional borrowers.

Similarly, the increase in the number of non-traditional borrowers is a key driver of the increase in overall debt and to the share of debt owed by students from for-profit institutions and 2-year public institutions. Table 4 shows aggregate federal student loan debt by institution type. Between 2000 and 2014, the amount of debt owed by borrowers who first attended a for-profit institution increased from $39 billion to $229 billion (in real 2013 dollars) and from $14 billion to $68 billion among borrowers who had first attended a 2-year public institution. The share of outstanding loan balances attributable to for-profit school students increased from 12 percent to 20 percent over that period, and from 4 to almost 6 percent among 2-year college students. The share of loans owed by borrowers from 4-year public and private institutions correspondingly fell by almost 10 percentage points from 83 to 74 percent.

To be more concrete about how changes in non-traditional borrowing have shaped the student loan market, Table 5 presents estimates of the 25 institutions in 2000 and 2014 whose students owe (collectively) the most in federal student loan debt. The table aggregates the total federal loan liabilities of all borrowers based on the last institution they had borrowed to attend (including undergraduate, graduate, and Parent PLUS loans) in each of those two years. In 2000, with the exception of the University of Phoenix, all the institutions are either 4-year public or private non-profit institutions; often state flagship universities and institutions with large graduate programs. In 2014, 8 of the top ten and 13 of the top 25 are for-profit institutions, and one private non-profit institution is largely an online program.[17] At certain institutions a majority of the debt is accumulated by graduate and professional students with high average balances, such as at Walden, Nova Southeastern, New York University, DeVry and the University of Southern California. But almost all of the debt at the University of Phoenix, DeVry University, Strayer University, Kaplan University-Davenport Campus, Ashford University, and ITT Technical Institute is undergraduate debt.

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[17] Loan balances from all federal sources (undergraduate, graduate, and parent) are aggregated for each institution that with an individual agreement to participate in Title IV programs (specifically by the 6-digit Office of Postsecondary Education ID). For some institutions, this aggregates over many branches or campuses but some institutions that are a part of larger umbrella organizations are identified separately. Using an alternative method of aggregating related institutions would lead to different but qualitatively similar results. For instance, if aggregated by parent company (for large for-profit chains) or state university systems (for 2-year or 4-year public institutions) 10 of the top 25 educational systems in 2014 would be for-profit systems, one is a non-profit organization (Nova Southeastern), and the other 14 are state university systems (Florida, New York, California, Georgia, Texas etc.).

Post-Recession Exodus: Rapid Increase in Repayment Flows

Panel B of Figure 2 shows the subsequent flow of borrowers into repayment by institution type. The large increase in borrowing at the onset of the recession subsequently turned into a mass exodus of borrowers into repayment as the recession waned. The exodus was magnified not just by the enrollment patterns during the recession--the fact that many new borrowers sheltered from the labor market by enrolling--but by the durations of their enrollment. Many borrowers from 4-year schools extended their enrollment by staying in school somewhat longer—delaying entry into repayment. And the surge in borrowing at the start of the recession was driven by relatively short-duration programs (like 1 and 2-year certificates and degrees) or short-duration enrollments as students rapidly dropped out. The confluence of these factors resulted in a spike of borrowers into repayment.

We will return to these dynamics later, but one observation is that there were simply many more borrowers entering into repayment over the last several years and many more borrowers entering into repayment relative to the number of new borrowers. About 63 percent of borrowers and about 62 percent of the aggregate value of loans were in repayment in 2013. This is up from 53 percent of borrowers and 60 percent of the value of loans in 2007. Hence, a much larger share of borrowers (and loan dollars) are feeling the burden of paying their loans today than in previous years. Moreover, many more borrowers are at the earliest years of repayment when the loan burdens (relative to earnings) are highest and when default-rates peak. Even absent any other changes in the loan market, this increase in the number and share of new entrants should be expected to result in high absolute numbers of students in default or struggling in their first years.

In addition to the sheer volume of borrowers entering repayment, the composition of borrowers and the institutions they attended changed substantially. To illustrate the magnitude of these changes, Figure 3 compares the number of borrowers entering repayment in 2000 and 2011.[18] The number of (undergraduate and graduate) borrowers entering repayment from for-profit institutions increased rapidly, from about 237,000 in 2000 (18 percent of borrowers), to 930,000 in 2011 (31 percent of borrowers). At 2-year institutions, the number of borrowers entering repayment increased from 150,000 in 2000 (12 percent) to 470,000 in 2011 (16 percent). Hence, in 2011, borrowers from for-profit and 2-year schools represented 47 percent of federal student loan borrowers entering repayment. After 2011, the number of for-profit borrowers entering repayment remained above 900,000 through 2014 and the number of 2-year borrowers continued to rise, hitting about 740,000 in 2014.

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[18] We choose 2011, in particular, for this comparison because it is the last cohort for whom we observe both labor market outcomes and 3-year cohort default rates (in 2013) and because we use this comparison in our decomposition analysis. Comparisons using alternative base years provide qualitatively similar results.

V. Who Are these New Borrowers?

Characteristics and Educational Outcomes of Non-Traditional Borrowers

The changes in who borrowed and where they borrowed have important implications for the composition and credit quality of the pool of borrowers, their educational outcomes, the amount of debt borrowers accrued, and their economic well-being after enrollment. The students who borrowed to attend these institutions were from more disadvantaged backgrounds (based on their family income), were older, independent, and, especially during the recession, likely to have struggled in the labor market. Non-traditional borrowers tended to attend institutions with relatively poor completion rates, and many appear to have failed to complete the programs they started. These latter factors, in particular, are associated with relatively poor labor market outcomes and loan distress.

Demographics and Family Background

The panels of Figure 4 summarize the characteristics and educational outcomes of borrowers entering into repayment in 2011 to provide an understanding of how changes in enrollment and borrowing patterns affected the overall characteristics of borrowers. In each panel, the figure presents a cross section of the characteristics or educational outcomes of borrowers who begin to borrow at different types of institutions as undergraduates.[19] While the characteristics of borrowers have changed within institutions over time to an extent, the cross sectional differences are persistent and therefore give a fairly good indication of how shifts in the share of borrowers across types of institutions is likely to change the characteristics of the borrowing pool.

Starting from the top left, the first panel shows that borrowers at more selective institutions tend to come from relatively more affluent backgrounds, with the median family income of dependent borrowers at the most selective institutions about $80,000 compared to about $48,000 at non-selective 4-year schools and 2-year schools, and $30,000 at for-profit institutions. These disparities widened modestly over the preceding decade. Because higher family income is positively correlated with labor market outcomes and negatively with default, these differences are one reason why outcomes vary across groups. It is well known that for-profit students tend to come from lower income backgrounds (Deming, Goldin and Katz (2012); Cellini (2009)), and the observed results are consistent with more vulnerable borrowers from lower income backgrounds increasingly borrowing to enroll in these institutions.

As the top middle and top right panels show, non-traditional borrowers are likely to be older and "independent" for financial aid purposes. For the 2011 cohort, the median age at entry was 24 for for-

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[19] Graduate-only borrowers are excluded.

profit schools and 23 for 2-year institutions, compared to 19 for students at 4-year institutions. For graduate-only borrowers, the median age at entry was 26. More than 90 percent of borrowers at the most selective 4-year schools are dependent borrowers versus 70 percent at non-selective institutions, 50 percent at 2-year institutions, and 37 percent at for-profit schools. This pattern is important for two reasons. First, older, independent borrowers are may have less ability to draw on their families for support during times of hardship. Second, independent borrowers have substantially higher loan limits, which allow them to take out more loans each year and to accumulate a higher total amount.

The bottom left and bottom middle panels illustrate two other dimensions of disadvantage. The bottom left panel shows the fraction of borrowers that are reported to be first generation college students based on the information in their financial aid form. About 57 percent of the 2011 repayment cohort who had attended for-profit schools were first-generation postsecondary students, compared to 51 percent at 2-year schools, 43 percent at non-selective 4-year institutions, and 25 percent at the most-selective institutions. Similarly, students from 2-year institutions and for-profit schools are more likely to live in areas with a higher fraction of households living in poverty and with a higher minority population (based on the 2000 Census).

Educational outcomes

Finally, the last panel in Figure 4 shows that non-traditional borrowers and those from non-selective 4-year institutions appear less likely to graduate from their programs of study than borrowers from most 4-year public and private institutions, based on information reported by the institution to NSLDS.[20] For instance, among borrowers entering repayment in 2011 who started at 4-year for-profit institutions, about 49 percent had completed a 4-year degree and 6 percent a 2-year degree, as reported by the institution to the Department of Education. At 4-year public institutions, the graduation rate was about 70 percent and at 4-year private institutions 76 percent. At 2-year public institutions, about 37 percent of borrowers were reported to have completed a 2-year degree and 18 percent a 4-year degree. In other words, the institution of first enrollment also had important implications for whether these borrowers were likely to complete their degree and whether they would earn a 2-year or 4-year degree. As we show later, completion rates are strongly associated with subsequent student loan default.

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[20] Because completion and withdrawal measures are solely reported by institutions to the NSLDS for purposes of determining the date at which a loan must enter repayment, institutions have no incentive to ensure the accuracy of their reports. Thus it makes no difference whether an institution reports a student withdrew or graduated and some institutions appear to report a student has withdrawn even if the student graduated. Nevertheless, these completion measures are highly correlated at the institution level with better validated data and, in our analysis, are highly correlated with other outcome measures, like default rates.

In all, the rise of non-traditional borrowing shifted the composition to borrowers more likely to struggle with their loan burdens—toward older, mid-career borrowers; borrowers from more disadvantaged family backgrounds and poorer neighborhoods; and toward programs many were less likely to complete.

VI.   Labor Market Outcomes of Borrowers

Other key differences between traditional- and non-traditional borrowers are their divergent labor market outcomes, and the differential impact the recession had on each group. Drawing on earnings records from tax data, we examine the labor market outcomes of these borrowers after they have entered repayment. For each repayment cohort, the labor market outcomes of borrowers differ based on the institutions they attend, with traditional borrowers earning substantially more. In addition, the earnings and employment rates of non-traditional borrowers declined much more over time, particularly during the recession.

Focusing first on the outcomes of all borrowers in repayment, including those who may have entered repayment many years earlier, shows surprising strength in the outcomes of student loan borrowers. Between 2002 and 2013, the median earnings of traditional borrowers in repayment actually increased. For graduate borrowers, the increase was from $61,000 to $63,100; for the borrowers from most selective 4-year institutions, from $47,300 to $48,000. During the same time period, median earnings declined among non-traditional borrowers. The declines were relatively small: from $24,800 to $23,200 for for-profit borrowers and from $30,100 to $25,900 for 2-year borrowers. Unemployment rates edged up slightly (by about 1 percentage point) among all groups.

For borrowers in their earliest years of repayment, the pattern of relative outcomes is similar but all groups fared worse. Figure 5 shows the unemployment rate of borrowers by institution type and compares the experiences of the 2000 and 2011 cohorts two years after entering repayment.[21] For the 2000 cohort, unemployment rates among traditional borrowers were low, ranging from 6.3 percent for borrowers from selective 4-year borrowers, to 6.5 percent for graduate borrowers, and to 10 percent for non-selective 4-year borrowers. For 2-year borrowers, the rate in 2000 was 12.2 percent and 13.2 percent for for-profit borrowers. Hence, even prior to the recent recession, there were large differences in employment across borrowers by institution type.

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[21]We define unemployment as having less than $1,000 of earnings in a year, which differs from the official definition of unemployment in that it does not differentiate voluntary non-employment (being out of the labor market or not looking for work) from involuntary unemployment. In addition, this measure whether a borrower was employed at all during a calendar year rather than during a particular week.

During the recession, unemployment rates increased substantially for non-traditional borrowers, but much less among other borrowers. Unemployment among for-profit borrowers jumped to 20.6 percent and to 16.9 percent among 2-year borrowers. For relatively selective 4-year borrowers, the rate increased from 6.3 percent to 7.2 percent, and for graduate borrowers from 6.5 percent to 7.1 percent. In other words, even among students leaving school in 2010 and 2011, near the peak of the recession, there was almost no change in the rate of employment among most traditional borrowers. While the insulating effects of a college degree are apparent in the aggregate unemployment statistics, it is clear that those effects also applied to even most young college borrowers in the years immediately after enrollment.

For those who did find work, a similar pattern applies to their earnings. Figure 6 presents the median earnings of borrowers with earnings of at least $1,000 by the institution type they first attended for the 2000 and 2011 repayment cohorts. In both cohorts, graduate-only borrowers and borrowers from more selective 4-year institutions earn substantially more than other borrowers. For the 2011 cohort, for instance, the median graduate-only borrower earned about $56,100 and the median borrower from a selective undergraduate institution earned about $42,300. In contrast, the median for-profit borrower who worked earned about $20,900 and the median borrower from a 2-year institution about $23,900. The median borrower from non-selective 4-year institutions earned about $29,100.

This pattern reflects both long-standing differences in the level of earnings across borrowers from different institutions—even in 2000 a borrower from a 4-year selective school earned 66 percent more than a borrower from a for-profit school—but also the disproportionate blow to the labor market outcomes of borrowers from less-selective institutions, for-profit schools, and 2-year colleges. Between the 2000 and 2011 cohorts, the median earnings of borrowers declined by 24 percent among for-profit borrowers (two years after entering repayment), 23 percent among 2-year borrowers, and 14 percent among non-selective 4-year borrowers, but only 7 percent among borrowers from the most-selective institutions, and 6 percent among graduate borrowers.

Non-traditional borrowers therefore faced a particularly severe outlook with almost 20 percent of non-traditional borrowers unemployed, and with the earnings of workers down more than 20 percent relative to their peers in earlier years. Hence, while most federal borrowers in repayment on their outstanding student loans had experienced relatively little change in earnings and employment over the course of the recession (or at least, had roughly the same earnings and employment rates as their peers in earlier years), the most recent cohorts of students faced particularly unfavorable outcomes.

VII. Debt Burdens

Increases in Borrowing per Student

The previous sections illustrate that there were many more non-traditional borrowers during and after the recession, that they are a particularly disadvantaged and high-risk group, and that they face relatively poor labor market outcomes when finishing school, particularly for the most recent cohorts of borrowers exiting school during and after the recession. This section examines how much they owed in federal loans and their debt service burdens.

Figure 7 compares the median loan balance of borrowers entering repayment in 2000 and 2011 by type of institution and selectivity of the institution last attended (in real 2013 dollars).[22] While non-traditional borrowers accrued relatively less debt than other borrowers—about $10,500 for the median borrower at for-profit institutions entering repayment in 2011 and $9,600 at 2-year institutions, compared to $17,600 at non-selective 4-year public and private institutions and $23,000 at the most selective—the increases in per-borrower debt have been much larger among non-traditional borrowers and borrowers from non-selective schools.

Over the period from 2000 to 2011, the increase in median balances (for borrowers entering repayment those years) was 39 percent at for-profit institutions, 35 percent among 2-year borrowers, and 37 percent among non-selective 4-year public and private borrowers. In contrast, balances among borrowers from the most selective 4-year schools increased 11 percent and 19 percent among graduate-only borrowers. The increase in individual categories was much larger than the overall increase in median balances (9 percent) since the overall increase in the median balance also captures the fact that borrowers shifted into non-traditional sectors, where typically students borrow less.

While the pattern of increases in average balances across institutions is largely the same, the magnitude is much larger because a rising share of borrowers accumulated substantial loan burdens. For instance, among borrowers who started at for-profit institutions, the increase in average balances was 51 percent between 2000 and 2011 (from $10,700 to $16,200), 32 percent at 2-year institutions (from $13,000 to $17,100), and 42 percent at the most selective 4-year institutions (from $27,500 to $39,100). These balances reflect the cumulative balance over a student's career, which may include moving from a 2-year institution to a 4-year, or from a 4-year institution to graduate school.

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[22] These balances include undergraduate loans and any subsequent graduate debt accumulated by borrowers.

Table 6 shows median borrowing per student. Borrowers from for-profit schools owed about $12,700 in 2013. Borrowers who last attended non-selective institutions owed about $20,100, compared to $26,400 for borrowers who attended the most selective institutions. Borrowers at 2-year colleges owed considerably less: on average $10,435. These differences in levels are even more striking because the average for-profit school borrower has borrowed for a shorter period of time.

One reason why the increase in typical federal debt burdens accelerated over the last few years is the increase in loan limits, which allowed borrowers to accrue more in loans each year and a larger cumulative total. Figure 8 shows how these increases in loan limits allowed borrowers to take out more federal loans and shows the median annual loan disbursement amount per active undergraduate borrower by institution type where the loan was disbursed. For instance, there is a clear increase in borrowing after the 2007-08 academic year, when loan limits were increased under the Higher Education Reconciliation Act of 2005. One salient observation is that borrowers from for-profit institutions, because they were predominantly independent borrowers, tended to have higher loan limits and took out larger loan amounts. Because of the jump in annual accruals, as borrowers subject to the higher limits entered repayment after subsequent years of borrowing, they entered repayment with higher balances.[23] The chart excludes graduate borrowers, whose annual borrowing is much greater.

Repayment Burdens Relative to Earnings

The combination of higher loan amounts and worsening labor market outcomes increased the burden on borrowers. To examine these burdens, we produce estimates of debt-service-to-earnings ratios (DE). To provide consistent measures of debt service, we assume the standard 10-year repayment plan (a 10-year amortizing loan) and use the (weighted average) interest rate on each student's loans in the year of repayment to estimate the annual payments.[24]

Table 7 provides estimates of the median DE ratio (the median debt service payment divided by median earnings) for borrowers two years after entering repayment, by institution type. For the cohort entering repayment in 2011, the median borrower had a loan burden of approximately 6 percent, just above the ratio of 5 percent in 2000. However, this apparent stasis belies considerable change within groups because of the changing composition of borrowers. Within all groups, DE ratios have weakly edged up,

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[23] At last higher federal balances; while private loan balances are small in the aggregate, without information on private loan balances for these students it is unclear to what extent federal loans represented new borrowing or substitution for private loans.

[24] Note that the debt service burdens we calculate here differ from those used for the Department of Education's "Gainful Employment" regulations, which use a 10-year amortizing schedule for less-than 4-year degrees or certificate programs, a 15 year schedule for BA programs, and a 20 year schedule for graduate programs. Hence, the debt-service to earnings ratios we calculate will be higher and not comparable to those used in the rule.

from 4 percent to 7 percent among for-profit borrowers, from 3 to 5 percent among 2-year borrowers, and from 7 to 9 percent among graduate borrowers. Selective borrowers saw no change.

Borrowers from 2-year college have historically had the lowest DE ratios—3 percent prior to the 2007 cohort, although, as in other sectors, DE ratios have risen in the 2-year sector. While the median DE ratio increased from 3 percent for the 2007 cohort to 5 percent in the 2010 cohort, the ratio remained below that of other institution types. Borrowers at for-profit institutions historically had relatively low DE ratios, but that increased the most over the prior decade, almost doubling from 4 percent to 7 percent. DE ratios tend to be higher early in repayment, which is also when the majority of defaults tend to occur, and fall gradually over time for the typical borrower as incomes increase and debt is paid down.

Of course, these ratios compare debt burdens to earnings, but not to ability to pay. Hence, the median annual debt service payment we calculate for the 2011 cohort of for profit borrowers ($2,200) or 2-year borrowers ($2,300) may be a much larger share of their disposable income than the annual payments for borrowers from relatively more selective 4-year institutions ($5,400) or graduate-only borrowers ($8,700).

VIII.   Default Rates and Repayment

Measures of Default and Delinquency

Since its inception in the early 1990s, the 2-year cohort default rate (presented in Figure 1) has been the most salient indicator of student loan defaults. Cohort default rates are defined by the year in which a cohort enters repayment, and are given by the fraction of borrowers who default within a certain number of years after that cohort begins entering repayment. The analysis in this section provides more detail on historical trends in this 2-year measure by institution type and alternative measures of default beyond the 2 and 3-year cohort default rate.

Figure 9 disaggregates the historical 3-year cohort default rate by type of institution first attended. It is apparent that historically there are large and persistent differences in default rates across institution type with non-traditional borrowers experiencing the highest rates of default. Moreover, default rates are most volatile among these borrowers, with default rates rising (and falling) more dramatically among for-profit and 2-year borrowers. Much of the previous 1990 peak in student loan defaults (which led to the introduction of the 2-year cohort default rate rules, the "85/15" rule limiting eligibility to Title IV funds, and automatic wage garnishment of borrowers) was driven by increasing default rates in the for-profit sector (apparently associated with correspondence courses), with default rates remaining largely unchanged and even declining in this time period at more selective institutions. Figure 9 shows that over

the course of the recent recession, default rates surged among for-profit borrowers, 2-year college borrowers, and borrowers from non-selective 4-year institutions, with more modest increases among traditional borrowers. Indeed, default rates within many types of organizations remain below the levels that existed as recently as the mid-1990s.

While default is a salient outcome, it may not capture distress among borrowers who use alternative payment plans or use forbearance or deferment to suspend payments. Similarly, the relatively short-term 2-year cohort default rate excludes impairments that occur later (or are deliberately deferred outside of the 2-year default-rate window). The use of forbearance, deferment, and income-based repayment plans are especially relevant following the Great Recession, as take-up has expanded and a large fraction of recent borrowers enroll in these programs. For instance, we estimate that that about half of borrowers in recent cohorts enter into forbearance in their first year of repayment. The use of these programs has helped many students facing labor market challenges avoid default. However, they obscure the fact that many more students may be struggling to repay their loans and that their loan balances remain unpaid and interest can continue to accrue.

To examine this we focus on several alternative measures of loan performance: longer-term default rates, which are defined as the fraction of borrowers who have ever defaulted in a specified period of time after entering repayment, and rates of negative amortization which we define as the fraction of borrowers who owe more in a given subsequent year than they did when entering repayment, and repayment rates, defined as the fraction of total principal and interest a borrower has paid after a given number of years. All of these measures point to deteriorating repayment outcomes, with an especially sharp decline in loan performance among non-traditional borrowers.

The first columns of Table 8 present the share of borrowers by institution that owe more two years after entering repayment than they had when they first entered repayment. This can occur because students defaulted (made no payments but accrued interest) but also in other circumstances where interest is accruing faster than payments are made, such as when a student is in forbearance or deferment and has unsubsidized loans; during the first few years of the graduated repayment plan; and if, under income-based repayment plans, the borrower's income is sufficiently low that required payments fall below interest accruals and result in negative amortization. As Table 8 shows, rates of negative amortization have surged, with almost three quarters of for-profit borrowers in the 2012 cohort apparently owing more than when they started borrowing. Rates of negative amortization are also rising within all institution types as more borrowers avail themselves of lower payment options to manage their finances during periods of hardship. These options delay or lower monthly payments, thus alleviating short term

repayment pressure, but interest continues to accrue, and potential financial liabilities of the student and federal loan program continue to grow.

The right side of Table 8 presents a longer-term perspective on default rates by showing 5 year cohort default rates by institution type. The last seven columns of Table 8 show 5-year cohort default rates. For the 2009 cohort, 47 and 38 percent of borrowers at for-profit and 2-year public and private institutions, respectively, defaulted within 5 years. This is a sharp increase from the 1999 cohort, in which 29 and 24 percent of for-profit and 2-year borrowers defaulted. The 5-year cohort default rates increased between the 2009 and 1999 cohorts at all institution types, but the increase was much smaller at more selective institutions. For example, at the most selective institutions, 5-year cohort default rates increased from 7.9 for the 1999 cohort to 10 percent for the 2009 cohort.

Figure 9 compares the 3-year default rate for the 2000 repayment cohort to that of the 2011 cohort. This figure is the starting point for the analytical exercise below, which attempts to quantify the contribution of the changes described above. The figure illustrates that for-profit, 2-year and non-selective schools have higher default rates than other institutions. While default rates have increased at all types of institutions, the increase in default rates has been greatest at for-profits and 2-year institutions.

Why Have Default Rates Increased?

Determinants of Non-Repayment

How are changes in the pool of borrowers, the institutions they attended, and their educational and labor-market outcomes associated with the performance of the federal loan portfolio? The aim of this section is to determine which factors are associated with student loan default, and which factors account for the increase in student loan defaults between 2000 and 2011. As a starting point in our analysis, we estimate basic models of default that represent the three-year cohort default rate as a function of the type of institution last attended and characteristics of students. The results in Table 9 indicate which variables are associated with defaults. The table presents results from a linear probability model

$$D_i = \alpha_i + \beta X_i + \gamma Z_i + \varepsilon_i \qquad (1)$$

where D_i is an indicator of default, α_i are institution type indicators, X_i are characteristics determined before enrollment such as family income or dependency status and Z_i are characteristics determined after enrollment such as labor market earnings or duration. The term ε_i is an error term, which is assumed to be orthogonal to the outcome conditional on the observables Z_i and X_i. The i subscript denotes the individual student. Characteristics X_i determined before enrollment are listed in table 9, and include

dependency status, age, family income broken down by dependency status, expected family contribution and graduate student status. Characteristics Z_i determined before enrollment are also listed in table 9, and include debt to earnings ratios, duration, marital status, completion status, degree attained, employment status and earnings. Further discussion of variable construction and data sources is provided in Appendix A.

The first three columns of Table 9 pool the entire sample, while columns (4) through (7) split the sample by the 2000 and 2011 samples. There is a strong relationship between the type of school attended and loan non-repayment. Even when controlling for observables, the relationship between school type and non-repayment remains substantial (and statistically significant at the .01 level), but the coefficients drop significantly when individual controls are added as seen in columns (2) and (3). This is consistent with the evidence above that rising enrollment of higher-risk borrowers is concentrated in the for-profit and 2-year sectors, with at least part of relationship between default and school type being driven by selection. Students at for-profits and 2-year colleges tend to come from lower income backgrounds, tend to earn less after graduation, and have weaker academic backgrounds compared to other students. In other words, because attending a for-profit or 2-year institution is correlated with living in a more disadvantaged area, being lower income, and having worse labor market outcomes, the coefficient on the for-profit indicator pools both the causal effect of attending a for-profit and unobserved characteristics correlated with both default and attending a for-profit.

Family income and earnings are also associated with default, and significant at the .01 level. Students from lower income backgrounds and students with higher debt burdens (relative to their earnings—not in absolute terms) are substantially more likely to default. Attainment shows a strong relationship with default, with students with higher levels of attainment (measured by completing a degree or attending graduate study) being significantly less likely to default. In the 2000 sample, the coefficients on school types are insignificant and are smaller than the coefficients in the 2011 sample. When all controls are included, the same basic pattern is seen with default rates being higher at for-profit and 2-year institutions, and individual regressors have similar signs and magnitude in 2000 and 2011, indicating that the relationship between observables and default is similar across years. Dependent students are also significantly less likely to default on loans as opposed to other borrowers. The basic patterns observed are consistent with default regressions in Knapp and Seaks (1992). Several of the regression coefficients increase in absolute value from 2000 to 2011, including those on the duration, graduate student status, and attending a for-profit school. This is consistent with changes in the selection of borrowers and the increasing enrollment of borrowers who are more likely to default on student loans.

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Decomposition Analysis

We use a decomposition to determine how default rates would have changed if the characteristics that changed between 2000 and 2011 and the correlations between those characteristics and default probabilities had remained constant. To determine the effect of individual characteristics on default, we use a non-linear variation on the standard Oaxaca-Blinder decomposition.[25] The aim of the procedure is to decompose the increase in student loan default between various institutional and individual characteristics. The standard linear decomposition measures the effect of a particular explanatory variable between 2000 and 2011 using the change in the mean of the explanatory variable multiplied by the coefficient from a linear regression. The non-linear procedure offers two significant advantages. First, student loan defaults lie in the tail of the distribution, where linear estimators tend to perform poorly. Second, there are large gaps in explanatory variables between 2000 and 2011, and linear estimators can lead to predicted probabilities above one or below zero.

The interpretation of the decomposition results depends on the cross-sectional association between default and the explanatory variables. For example, the validity of the counterfactual for earnings depends on whether or not earnings have a causal impact on default through liquidity constraints or another channel, or if earnings are correlated with default through unobservable channels. To date there has been more descriptive evidence and less analysis of the causal impact of various factors on default, and many questions remain open. For example, there is a strong association between attending a for-profit college and default, and this could reflect both the causal impact of attending a for-profit and the effect of unobservably riskier students sorting into for-profits.

Table 10 presents the results of the non-linear decomposition.[26] The decomposition results indicate that changes in observable characteristics of borrowers, institutions, and their labor market outcomes are associated with approximately two thirds of the increase in student loan default rates. The results confirm the earlier graphical analysis in that the increase in student loan non-repayment is concentrated among non-traditional borrowers. The first row of Table 10 shows three-year cohort default rates in 2011, the second row shows default rates in 2000, and the third row shows the difference. The fourth row shows the change associated with observed explanatory variables (endowments) given by the procedure outlined above.

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[25] For further detail on the non-linear Blinder (1973); Oaxaca (1973) procedure, a detailed description is given in the appendix.

[26] The results are similar using a linear decomposition.

The first column includes only indicators for the type of institution attended, and institutional selectivity. Changes in institution type and selectivity alone are associated with approximately 45 percent of the increase in student loan defaults. Column (2) adds family background characteristics and column (3) adds various labor market, loan, education, and background characteristics. The association between school types and default drops when individual characteristics are included, which could reflect the school type indicators capturing unobserved student specific factors. Changes in family background characteristics over the time period lead to little change in default rates in the aggregate, largely reflecting the fact that average family income did not change much. While non-traditional borrowers were from poorer families, traditional borrowers tended to be from somewhat higher-income families. The largest contributors are changes in labor market characteristics that explain roughly one quarter of the increase in student loan non-repayment, and changes in family background characteristics explain a smaller portion of the increase in default. This effect is driven almost entirely by changes in earnings and family incomes among non-traditional borrowers from for-profit and 2-year institutions as is shown in columns (4) through (9).

Because family background, debt burdens, and labor market outcomes are highly correlated with the institutions borrowers attend, it is difficult to distinguish in the aggregate analysis whether changes in default are arising because of changes where borrowers attend or changes in the characteristics of borrowers themselves. Columns (4) through (9) repeat the analysis by institution type to examine how changes in borrowers' characteristics and outcomes are associated with sector-specific default rates. Changes in labor market outcomes and family background characteristics explain between one-third and one-half of the increase in default among non-traditional borrowers. But a large fraction of defaults appear to arise for reasons not well explained by the characteristics of students or outcomes that we observe, such as characteristics or quality of their education or institution, or other indicators of financial hardship or ability to pay of students. At four-year public and private institutions, changes in labor market outcomes and family background explain very little to none of the increase in default, or offset each other, which is not surprising because there is little increase to explain.

A limitation of this approach is that it does not identify the causal source of these changes. For instance, labor market outcomes among non-traditional borrowers could deteriorate because of (unobserved) changes in the characteristics of the borrowers themselves, such as being drawn from lower-skilled groups, or changes in the characteristics of the institutions they attended. For example, if they attended programs that borrowers were unlikely to complete or that did not lead to better jobs, or simply because of economic shocks that disproportionately affected those borrowers.

In summary, almost all of the overall increase in defaults is associated with non-traditional borrowers, both because they are a rising share of all borrowers, and because their default rates have increased. While much of this increase is associated with observed changes in the characteristics of borrowers, institutions, and labor market outcomes, a sizable portion is not. Several unobserved characteristics are also likely to be important, and this could bias the estimates presented. Several of these characteristics are either difficult to observe directly, such as the level of satisfaction a borrower has with the institution attended, or unavailable in our data, such as financial characteristics like other liabilities.

IX.   Other Indicators of Stress and Wellbeing in the Student Loan Market

The analysis above focused on a how changes in the risk characteristics of borrowers and institutions contributed to default rates. This section examines three other dimensions of stress, burden, and wellbeing in the student loan market.

First, we examine the distribution of debt, earnings, and income to better understand the characteristics and ability to pay of borrowers and to inform who is disproportionately burdened by debt. Second, we examine the characteristics of borrowers with very large balances. While large loan burdens were historically largely confined to graduate borrowers and borrowers at the most selective institutions, a rising share of large loan balances are owed by undergraduate borrowers, often "independent" borrowers, and at less-selective institutions. Finally, we examine whether and how ability to pay may evolve over the career of a borrower to help understand whether two factors identified above—the surge of recent borrowers into repayment post-recession and the disproportionate effect of the recession on those borrowers—are likely to be transitory or persistent shocks to borrowers' long-term ability to pay. We show how DE ratios have evolved for successive cohorts of borrowers both from cohort to cohort and within cohorts over time. Indeed, the first several years of borrowing are particularly risky.

The relationship between Labor Market Outcomes and Debt Burdens

The evidence presented above illustrates that borrowers who attend relatively more selective institutions and graduate schools borrow more, tend to come from higher-income families, and subsequently earn more after entering repayment. We formalize these relationships in Table 11 and subsequent figures, which examine the distribution of debt, income, and earnings.

The top panel of Table 11 divides the pool of borrowers in repayment on federal student loans in 2013 into quintiles based on their total debt burdens. The second and third columns show the median earnings and income of each group of borrowers. Borrowers with larger debts have higher incomes and earnings.

The last column shows that the top 20 percent of borrowers owe 62 percent of all federal student loan debt.

The middle panel of Table 11 categorizes these same borrowers by their place in the national income distribution in 2013 (based on total income for married and unmarried filers plus information returns for non-filers).[27] Column 6 shows that while 21 percent of borrowers are in the bottom 20 percent of the (national) income distribution, borrowers in general tend to fall into the higher income groups. For instance, almost 26 percent of borrowers fall into the top 20 percent of the income distribution. The last column shows that 35 percent of all student loan debt is held by borrowers with incomes that put them in the top 20 percent of the distribution, and almost 60 percent is held by the top 40 percent.

The final panel provides a comparable analysis based on individual earnings. Each borrower is assigned to an earnings quintile based on their relative rank in the national earnings distribution (estimated from the 2013 Annual Social and Economic Supplement to the Current Population survey and adjusted for the age- and gender-distribution of student-loan borrowers). Again, about 25 percent of borrowers are in the top 20 percent of all wage earners; these borrowers hold about 36 percent of all student-loan debt.

These tables include both traditional and non-traditional borrowers, who experience very different economic outcomes. For instance, more than 30 percent of non-traditional borrowers are in the bottom 20 percent of the earnings distribution and only 13 percent in the top 20 percent. Among traditional borrowers, the pattern is reversed, with 35 percent in the top 20 percent and only 13 percent in the bottom 20 percent. And about half of all student loan debt is owed by traditional borrowers in the top 40 percent of the income distribution.

Figure 11 examines the relationship between the amount of debt a borrower has accrued and their earnings two years after entering repayment. Panel A shows non-parametric estimates of the density of income two years into repayment.[28] The light blue line shows the income density for borrowers with more than $25,000 in debt and the lightest line shows the income density for borrowers with less than $25,000 in debt. The solid blue line shows the income density for borrowers with a large amount of borrowing—over $75,000, which corresponds roughly to the 95th percentile of outstanding debt. The

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[27] Because borrowers tend to be younger than the tax-filing population, we re-weight the total filing population based on the age distribution of student loan borrowers.

[28] The kernel density estimate at a point x is given by $\widehat{f_k} = \frac{1}{hn}\sum_{i=1}^{n} K\left(\frac{x-x_i}{h}\right)$ where h is the bandwidth K of an Epanechnikov kernel.

sample is restricted to individuals between the ages of 25 and 34 and individuals with a positive loan amount. As a basis for comparison, the black line shows the density of all tax filers.[29]

Panel B shows average income in $10,000 borrowing bins in 2010. The figure shows that the larger the student debt balance, the more the student tends to earn. This relationship is intuitive—students with larger debts tend to have been enrolled longer, achieved higher levels of educational attainment, pursued higher levels of postsecondary education (such as a BA instead of a certificate or a graduate degree), and have attended 4-year institutions where borrowing amounts are greatest, which tend to be the more selective 4-year institutions. For these reasons, borrowers with more debt tend to earn much more.

Figure 11 illustrates two things. First, borrowers tend to have higher earnings than non-borrowers. Individuals between the ages of 25 and 34 with no student debt earn $37,545 on average while individuals with student debt earn $43,224. Further, larger debt amounts are strongly correlated with higher borrowers' earnings. Mean income is $51,555 for borrowers who have more than $25,000 in debt, while it is $40,612 for borrowers with less than $25,000 in debt. Borrowers with debt above $75,000 earn slightly over $60,000 annually. There are significantly more individuals with debt above $75,000 who earn more than $100,000 annually

In addition to earning more, borrowers with more student loans also come from higher income families, per the information provided on their first FAFSA. Table 11 provides further information on borrowing, earnings, income and family income by the distribution of borrowing. The table shows, for instance, that borrowers in the top quintile in terms of borrowing earned more than twice as much as borrowers in the bottom quintile of the borrowing distribution. Again, this relationship largely arises because of the types of institutions borrowers attend, with borrowers taking on relatively larger debts at more selective schools, which enroll relatively higher-income students.

Borrowers with Large Balances

An increasing portion of students have very high loan burdens, with the fraction of borrowers who owed more than $50,000 in real terms almost doubling between 2000 and 2013. Figure 12 shows that the distribution of loan burdens across borrowers has become more skewed and the number of extremely large balances has increased. While loan burdens over $50,000 were once relatively rare—roughly 7 percent of borrowers in the 2000 and 2001 cohorts—over 10 percent of borrowers in the 2013 cohort owed more than $50,000 and almost 5 percent owed more than $100,000.

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[29] The income density is estimated using the distribution Log-N(10.1986, .989679), which was estimated using a sample of tax return data.

Table 12 shows the characteristics of borrowers with large balances. The share of borrowers with large balances increased sharply between 2000 and 2014. In 2000, 5 percent of borrowers had balances above $50,000, in real terms, and only 1 percent of borrowers had balances above $100,000 dollars. By 2010, these percentages increased to 14 percent and 4 percent respectively. While large loan balances receive substantial attention, the implications of large balances depend crucially on the returns to borrowing and education, a point made by Avery and Turner (2012). The majority of borrowers with large balances borrowed to pay for graduate school, and individuals with graduate degrees tend to have high incomes and low loan non-repayment rates. Still, in 2000 nearly a fifth of borrowers with balances above $50,000 borrowed for only undergraduate programs, and this fraction rose to almost a third in 2014. Most of these borrowers are independent undergraduate students, typically at for-profit schools. Moreover, there has been a rise in graduate borrowing at for-profit institutions, with the share of graduate borrowers with large balances at for-profit institutions rising from 5 to 15 percent between 2000 and 2014. There were also large increases in the share of borrowers with large balances at for-profit and non-selective schools.

The Evolution of Debt Burdens over a Career

Another important question is whether today's high debt burdens are likely to be temporary or permanent. While one important factor is the labor market, which has improved gradually for many (but not all) borrowers, another potential temporary factor is that earnings are temporarily low in their first years after entering repayment, and in recent years there have been a disproportionate share of new entrants. This means that many recent entrants' debt burdens will naturally improve as they progress in their careers. Indeed, this pattern is an important justification for providing facilities like income-based repayment, which is intended to aid students who are 'solvent' in the sense that their long-run earnings are sufficient to repay their loans but 'illiquid' because their loan obligations must be paid out of current income, which can start off at low levels.

Figure 13 illustrates how loan burdens evolve over their careers after entering repayment, and provides a longer-term perspective of the combined effect of rising indebtedness and lower earnings on borrowers' debt-to-earnings ratios. The estimates of DE ratios are based on a 10-year amortizing loan (using actual starting balances and interest rates) and the empirical earnings of borrowers from each cohort. The figure shows that, across all cohorts, burdens are highest in the initial repayment years and fall over time as earnings improve. Prior to the Great Recession, starting DE ratios were increasing slightly but, for cohorts that entered repayment during and after the Great Recession, initial DE ratios increased sharply. Despite starting at high levels, within a few years DE ratios converged to historical norms after several years in repayment. The results in Figure 13 suggest that liquidity issues play an important role in distress and default among borrowers early in their careers, despite the likelihood that over a longer

horizon their debt burdens are likely to be manageable. Indeed, this pattern is a primary motivation for income-based repayment programs, which make repayment schedules adapt to swings in income by deferring or reducing (with interest) loan payments.

X.   The Outlook: Changes in Borrowing Patterns Post-Recession

The Great Recession had a substantial effect on educational enrollment and borrowing, but its effect is declining. Educational enrollments are counter-cyclical, and recessions can affect borrowing both through the decreased opportunity cost of college enrollment and through increased financial pressure due to lower earnings and assets.[30] The Great Recession was no exception to this pattern, and inflows into borrowing increased sharply and then declined following the recovery. Moreover, two additional factors related to and coinciding with the Great Recession could have increased borrowing. First, pressure on state budgets led to cuts for many public institutions. Part of these cuts may have been passed on to students, leading to higher borrowing. Second, access was restricted in many alternative credit markets. Restricted availability of other forms of lending may have led to increased student loan borrowing, especially from students who otherwise would have relied on private parental borrowing. Hence, whether these pressures and patterns are likely to persist has important implications for the long-term costs and benefits of federal lending programs.

Figure 14 shows that the inflow of new borrowers and the outflow of borrowers who paid off loans changed substantially during the recession, but, more recently, is approaching pre-recession levels. Prior to 2002, about 1.8 million new borrowers took out loans for the first time and 1.1 million borrowers a year had repaid their loans in full; hence the number of outstanding student loan borrowers was only increasing by more than 600,000 borrowers a year. Starting in 2003 and continuing through to 2007, about 2.4 million new borrowers took out first time loans each year, and about 1.1 paid off their loans entirely. During those years, the annual increase in the number of borrowers increased to 1.3 million. At the onset of the recession, the number of new borrowers increased sharply. From 2009 to 2011, the number of first-time borrowers increased to 3.2 million and the number of borrowers repaying loans off entirely fell to just over 1.1 million, leading to an increase in the number of borrowers of more than 2 million each year.

More recently, the number of borrowers paying off loans has also increased from 1 million in 2009 to 1.6 million in 2014. Led by reductions at for-profit schools, where first-time borrowing started to drop in 2011, and at 2-year colleges in 2012, the number of new borrowers fell to 2.5 million in 2014. Given the

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[30] For example, see Bound, Lovenheim and Turner (2010).

lag between enrollment, borrowing, and loan repayment, many of the borrowers who enrolled during the Great Recession entered into repayment in 2010 and later, which can be seen in Figure 2. As of 2014, flows into repayment have not yet begun to drop.

Just as the sharp rise in new non-traditional borrowers during the Great Recession contributed to rising rates of default, the subsequent decline is likely to improve outcomes in the future. Figure 8 indicates that default rates are already dropping at for-profit institutions. The combination of relief from recession, the new "gainful employment" rules, scrutiny of the for-profit sector, and relief for state budgets, which allows for more (and less expensive) seats at community colleges, and improved protections for low-income borrowers, all suggest that a combination of forces may put downward pressure on student loan default rates in the future.

Another important factor for gauging how persistent distress is likely to be is how today's borrowers manage their loan burdens and how much of their burdens are repaid over time. Figure 15 illustrates the fraction of the initial repayment balance owed over time—the repayment rate. Recent cohorts have been paying off their loan balances at a slower rate than earlier, cohorts, with the median borrowing in the 2011 cohort actually owing more after two years than they owed in their first year of repayment. The typical borrower in cohorts that entered repayment in the late 1990s had repaid their balance within ten years of entering repayment, but subsequent cohorts have repaid more slowly. This is especially true of non-traditional borrowers. Slowing repayment rates appear due to high rates of default in recent cohorts, as well as from increased use of programs such as income based repayment, forbearance, and deferment among unemployed or low-income borrowers, in which borrowers' payments are suspended or reduced.

The first observation above—the shift in the composition of borrowers during the recessions and the reversal of flows associated with the recession—suggests that more recent borrowers will have better outcomes than those during the recession, if only because the types of borrowers and institutions attended have shifted. But the latter observation—slowing repayment rates—suggests that if recent patterns persist, the burdens owed by yesterday's students may endure for years.

XI. Concluding Remarks

This paper uses a new administrative data source to examine the increase in borrowing and non-repayment between 1996 and 2014. We show that increases in default and delinquency are largely due to increases in the number of non-traditional borrowers and increases the rate of default among these borrowers. These recent non-traditional borrowers were disproportionately older, independent of their parents, from lower-income families, and living in more disadvantaged areas. They borrowed substantial amounts to attend institutions with low completion rates and, after enrollment, experienced poor labor

market outcomes that made their debt burdens difficult to sustain. More than a quarter defaulted on their loans within three years and many more are not making progress repaying their loans.

Among traditional borrowers, default rates have remained low and outcomes have remained stable or even improved in recent years, despite the recession. Traditional borrowers tend to have higher incomes than the general population, and to owe larger loan balances. Even traditional borrowers with large balances on average do well, largely because these borrowers acquired large balances attending selective schools or graduate and professional programs. Decomposition analysis indicates that the increase in non-repayment is largely associated with changes in the types of institutions that individuals attend. Deteriorating labor market outcomes, which are concentrated among non-traditional borrowers at for-profit and 2-year institutions, are also associated with a substantial portion of the increase in default rates.

The unwinding of recent trends is likely to put downward pressure on default rates. The economic environment before, during and after the Great Recession led to a surge in enrollment at 2-year, for-profit, and other non-selective institutions. As the recession waned, the surge in entry turned into an exodus as millions of borrowers left school and became responsible for making loan payments. Hence, not only were there vastly more federal borrowers, but many of them were in their first years of loan repayment, when borrowers' careers are just starting and their earnings are the most variable. The wave of borrowers that began to borrow during the recession began to start repayment on those loans in increasingly large numbers from 2011 through 2014, when almost 4 million borrowers entered repayment—more than double the number in a typical year prior to the recession. Because borrowers are most likely to default in the first three years of repayment, that wave of borrowers has or will translate into a surge in the number of defaults in 2013 through at least this year. However, because of the 'life cycle' of borrowing, delinquencies and defaults are a lagging indicator, and the current high rate of delinquency obscures some more favorable recent trends. In particular, the number of new borrowers at for-profit and 2-year institutions has dropped substantially, due to the end of the recession and to increased oversight of the for-profit sector, which is likely to improve the risk characteristics of future repayment cohorts. Moreover, borrowing by first-year borrowers and other enrolled students has declined, both in the number of borrowers and the amounts borrowed. These factors, coupled with efforts by the Department of Education to expand and encourage the use of income-based repayment programs are likely to put downward pressure loan delinquency in the future, although with a lag.

While outcomes are likely to improve for today's new borrowers, concerns about the student loan program are likely to persist. Many institutions continue to make high-risk loans to students on behalf of

the federal taxpayer in return for educational programs that often do not result in a degree or do not result in a degree that leads to a high-paying job. Recent work has pointed out that unqualified aid, particularly aid limited only by costs of attendance, is contributing to loan burdens by increasing students' educational costs and their need to borrow (Cellini and Goldin 2014; Lucca, Nadauld and Shen 2015; Turner 2014). And our work suggests that weak economic outcomes and poor loan performance are concentrated in certain sectors where institutions have not been held accountable for the outcomes of their programs either through market mechanisms or regulatory oversight. Finally, a fraction of existing borrowers, mostly non-traditional borrowers, appear mired in a system where they are unlikely to have the resources to repay their loans in full, and yet generally have no way to have those loans discharged.

Many other questions related to the efficiency of student loan programs remain unresolved. For instance what role did increases in tuition and fees, cuts to public institution funding, and the financial crisis have on student borrowing? What characteristics of institutions (or students) predictably result in high rates of delinquency and default, and what policies can reduce the likelihood and costs of default? How have recent reforms to education policy improved outcomes for borrowers, institutions, and the budget? Which colleges are worth the returns to education investment? While many questions about the student loan market remain open, this analysis is a first step towards explaining recent trends in the student loan market and the contribution of non-traditional borrowers to the ongoing increase in borrowing and loan delinquency.

References

AKERS, B., AND M. CHINGOS (2014): "Is a Student Loan Crisis on the Horizon?," *Brookings Center on Education Policy* Mimeo.

AVERY, C., AND S. TURNER (2012): "Student Loans: Do College Students Borrow Too Much–Or Not Enough?," *Journal of Economic Perspectives*, 26(1), 165-92.

BARRON's. (2008) "Barron's Profiles of American Colleges." Great Neck and Woodbury, NY: *Barron's Educational Series, Inc*.

BAUM, S. (2015): "Does Increasing Reliance on Student Debt Explain Declines in Entrepreneurial Activity?," *Urban Institute* Working Paper.

BAUM, S., AND M. C. JOHNSON (2015): "Student Debt: Who Borrows Most? What Lies Ahead?," *Urban Institute* Working Paper.

BLEEMER, Z., M. BROWN, D. LEE, AND W. VAN DER KLAAUW (2014): "Debt, Jobs, or Housing: What's Keeping Millennials at Home?," *Federal Reserve Bank of New York* Staff Reports.

BLINDER, A. S. (1973): "Wage Discrimination: Reduced Form and Structural Variables," *Journal of Human Resources*, 17, 436–455.

BOUND, J., M. LOVENHEIM, AND S. TURNER (2010): "Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources," *American Economic Journal: Applied Economics*, 2(3), 129–157.

BRICKER, J., M. BROWN, S. HANNON, AND K. PENCE (2015): "How Much Student Debt is Out There?," *FEDS Note*, August 7.

BROWN, M., A. HAUGHWAUT, W. VAN DER KLAAUW, AND J. SCALLY (2014): "Measuring Student Debt and its Performance," *Federal Reserve Bank of New York* Staff Reports.

CADENA, B. C., AND B. J. KEYS (2013): "Can Self-Control Explain Avoiding Free Money? Evidence from Interest-Free Student Loans," *The Review of Economics and Statistics*, 95(4),1117–1129.

CELLINI, S. (2009): "Crowded Colleges and College Crowd-Out: The Impact of Public Subsidies on the Two-Year College Market," American Economic Journal: Economic Policy, 1(1), 1–30.

-- (2010): "Financial Aid and For-Profit Colleges: Does Aid Encourage Entry?," *Journal of Policy Analysis and Management*, 29(3), 526–552.

CELLINI, S. AND GOLDIN, C. (2014): "Does Federal Student Aid Raise Tuition? New Evidence on For-Profit Colleges." *American Economic Journal: Economic Policy,* 6(4): 174-206.

CHAPMAN, B. (1997): "Conceptual Issues and the Australian Experience with Income Contingent Charges for Higher Education," *The Economic Journal*, 107(422), 738–751.

-- (2006): "Income Contingent Loans for Higher Education: International Reform," *Handbook of the Economics of Education*, 2, Editors, Eric Hanushek and Finis Welch, 1453–1503.

CHATTERJEE, S., AND F. IONESCU (2012): "Insuring Student Loans Against the Financial Risk of Failing to Complete College," *Quantitative Economics*, 3(3), 393–420.

DEMING, D. J., L. KATZ, AND C. GOLDIN (2012): "The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators," *Journal of Economics Perspectives*, 26(1), 139–64.

DEPARTMENT OF EDUCATION (2014a): "National Student Loan Data System," User Documentation.

-- (2014b): "Student Loans Overview," Fiscal Year 2014 Budget Proposal.

DYNARKSI, S., AND D. KREISMAN (2013): "Loans for Educational Opportunity: Making Borrowing Work for Today's Students," *Hamilton Project* Discussion Paper.

FAIRLIE, R. W. (1999): "The Absence of African-American Owned Business: An Analysis of the Dynamics of Self-Employment," *Journal of Labor Economics*, 17(1), 80–108.

FIELD, E. (2014): "The Effects of Student Loans on Long-Term Household Financial Stability," *American Economic Journal: Applied Economics*, 1(1), 1–21.

FORTIN, J. D. N., AND T. LEMEIUX (2007): "Decomposing Wage Distributions using Recentered Influence Function Regressions," *Econometrica*, 64(5), 1001–44.

FORTIN, N., T. LEMEIUX, AND S. FIRPO (2010): "Decomposition Methods in Economics," *NBER Working Paper*, (16045).

GICHEVA, D. (2013): "In Debt and Alone? The Causal Link between Student Loans and Marriage," Unpublished Mimeo.

GICHEVA, D., AND J. THOMPSON (2014): "The Effects of Student Loans on Long-Term Household Financial Stability," Unpublished Mimeo.

GOODMAN, S., AND A. HENRIQUES (2015): "The Effect of Shocks to College Revenues on For-Profit Enrollment: Spillover from the Public Sector," *Federal Reserve Board* Working Paper.

HARTMAN, R. (1972): "Equity Implications of State Tuition Policy and Student Loans," *Journal of Political Economy*, 80(3), 142-171.

HOXBY, C. (2009): "The Changing Selectivity of American Colleges," *Journal of Economic Perspectives*, 23(4), 95–118.

IONESCU, F. (2009): "The Federal Student Loan Program: Quantitative Implications for College Enrollment and Default Rates," *Review of Economic Dynamics*, 12(1), 205-231.

-- (2011): "Risky Human Capital and Alternative Bankruptcy Regimes for Student Loans," *The Journal of Human Capital*, 5(2), 153-206.

JOHNSON, W. (2006): "Are Public Subsidies to Higher Education Regressive*," Education Finance and Policy*, Summer, 288-315.

KNAPP, L. G., AND T. G. SEAKS (1992): "An Analysis of the Probability of Default on Federally Guaranteed Student Loans," *The Review of Economics and Statistics*, 74(3), 404–411.

LOCHNER, L., AND P. BELLEY (2007): "The Changing Role of Family Income and Ability in Determining Educational Achievement," *Journal of Human Capital*, 1(1) 37-89.

LOCHNER, L., AND A. MONGE-NARANJO (2011): "The Nature of Credit Constraints and Human Capital," *American Economic Review*, 101(6), 2487–2529.

(2015): "Student Loans and Repayment: Theory, Evidence and Policy," *Handbook of the Economics of Education*.

LONG, B. T. (2014): "The Financial Crisis and College Enrollment: How Have Students and Their Families Responded?" vol. Editors, Jeffrey R. Brown and Caroline M. Hoxby, University of Chicago Press.

LUCCA, D., NADAULD, T., AND SHEN, K. (2015): "Credit Supply and the Rise in College Tuition: Evidence from the Expansion of Federal Student Aid Programs." *Federal Reserve Bank of New York Research Paper,* July, 733.

MARX, B., AND L. TURNER (2015): "Borrowing Trouble: Student Loans, the Cost of Borrowing, and Implications for the Effectiveness of Need-Based Grant Aid," Unpublished Mimeo.

MEZZA, A., K. SOMMER, AND S. SHERLUND (2014): "Student Loans and Homeownership Trends," *FEDS Note*, October 2014.

OAXACA, R. L. (1973): "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review*, 14, 693–709.

PSACHAROPOULOS, G., AND G. PAPAKONSTANTINOU (2005): "The Real University Cost in a "Free" Higher Education Country," *Economics of Education Review*, 24(1), 103–108.

SHAO, L. (2014): "Debt Marriage and Children: The Effect of Student Loans on Marriage and Fertility," Unpublished Mimeo.

SUN, S., AND C. YANNELIS (2014): "Credit Constraints and Demand for Higher Education: Evidence from Financial Deregulation," *Stanford Working Paper*.

THE COLLEGE BOARD (2013): "Trends in Student Aid" .

TURNER, L. (2014) "The Road to Pell: The Economic Incidence of Federal Student Grant Aid." Unpublished Mimeo.

TURNER, N. (2012): "For-Profit College Entry and Not-for-Profit Enrollment: Crowding out or crowding in?," Unpublished Mimeo.

YUN, M.-S. (2004): "Decomposing Differences in the First Moment," *Economics Letters*, 2, 275–280.

APPENDIX A

Data Sources:

NSLDS

The main data source in this paper is the National Student Loan Data System (NSLDS) which is the primary system used to administer student loan programs. The Department of Education is required to administer the NSLDS by the Higher Education Act of 1965. The NSLDS links information on loans and grants from students, borrowers, lenders, guaranty agencies, schools, and servicers. As of January 2014, the NSLDS contained over 30 billion records on 84,629,538 students and 386,943,660 loans.[31] The data used in this analysis was assembled pursuant to an agreement between the US Treasury and the Department of Education to improve tax administration, to improve education-related tax and fiscal policy, and enhance forecasts and projections of tax and educational policy.

Lenders, guaranty agencies, schools, and servicers are required to report information to the NSLDS within 30 and 120 days of new information arriving. For example, defaults must be reported within 90 days of a loan entering default and changes in enrollment must be reported within 30 days of a change in enrollment status. Updates can be done either electronically or by mail, but today are usually done online. Information in the NSLDS is used to determine eligibility for Title IV programs under rules such as Gainful Employment report standards.

The analysis in this paper is based on a 4 percent random sample of student loan borrowers matched to individual earnings records. The raw loan and demographic data is used to construct a person-by-year individual panel providing information on student characteristics, institutional information, and federal loan information as of the close of each federal fiscal year.

The educational records are sampled as of the end of fiscal years from 1970 to 2013 from transactions records from FSA's operational database. The sample is intended to reflect loan balances and status as of the close of the fiscal year and to reflect characteristics of borrowers and institutions as reported on aid applications and by institutions corresponding to the years in which loans were disbursed. The sample was initially created by the Department of Education's Budget Service Division to be used in budget projections. The sample includes federal direct and federally guaranteed students loans, including both the Federal Family Education Loan Programs and the Direct Loan Program. The sample does not include Perkins loans. Parent PLUS loans are included in the analysis but the outcomes of parent borrowers are excluded from our analysis of the outcomes of borrowers after entering repayment. Private student loans

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[31] For more information on the NSLDS see The Department of Education (2014).

are not included in the analysis sample if they were not made under the FFEL program. The NSLDS contains the vast majority of direct student loans, as private student loans not guaranteed by the federal government only account for a tenth of the market, and much less prior to 2005.[32]

Most basic loan information is available from all sample borrowers since 1970 including loan balances, type of loan, the institution the loan was disbursed to (including the type and control of the institution, and the academic level of the borrower), and information regarding whether student completed the program, and the dates borrowing was initiated, when repayment on each loan began, and whether the loan was in deferment, forbearance, default, or in certain alternative repayment plans. In general, borrowers join the sample in the year when they receive their first loan. Borrower information from the FAFSA is generally only available for loans originated after the 1995 fiscal year. Estimates from these data match up closely to aggregate statistics published by the department of Education, regarding the total volume of existing loans over time, the number of borrowers, and estimated cohort default rates. Repayment is defined as the date at which a borrowers' last loan enters repayment, as some borrowers take out multiple loans for different programs.

The main NSLDS file has been matched to information from the Free Application for Federal Student Aid (FAFSA), in the years those data were available for the first completed FAFSA for each borrower (except for borrowers in 1995, this is generally when their first loan is disbursed). The FAFSA contains detailed information on student demographics and family background. Students are required to fill out the FAFSA in each year that they receive aid or loans. The NSLDS has also been matched to Pell Grant records which contain additional grant applications and receipt. The main NSLDS sample is merged to a panel of administrative tax and earnings records that span the period from 1999-2013.

Administrative Tax and Earnings Records

The main source of earnings records is tax records spanning the period from 1999 to 2013. These records contain data from federal income tax records between 1996-2013, compiled from individual returns and W-2 information returns. Income is measured at the tax unit level; earnings at the individual level.

Variable Construction

Loan Volumes: Loan volumes refer to the last loan balance recorded in the NSLDS in each calendar year. Outstanding balances are reported to the NSLDS and updated within 120 days of loans being disbursed. Dollar values are in 2013 dollars unless noted otherwise.

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[32] For more information on private student loans, see Bricker, Brown, Hannon and Pence (2015),

Default: Default rates are defined as an indicator of whether an individual enters into default with a certain number of years since repayment begins. The last recorded repayment and default rates are used for an individual. A loan goes into default if payments are more than 270 days late. Servicers have 90 days to report default to the NSLDS after a loan goes into default.

Dependency Status: This variable is constructed from the FAFSA. A students' first recorded dependency status is recorded, from the first FAFSA filed.

Family Income: Family income is obtained from the FAFSA. Dollar values are in 2013 dollars unless noted otherwise. A students' first recorded family income is used, from the first FAFSA filed.

Active Borrower: Active borrowers are borrowers who have received loan disbursements in the fiscal year determined by the NSLDS.

Poverty: Federal poverty guidelines are used to determine distance for poverty line thresholds as defined by HHS.[33] Earnings and family size are determined by tax returns using the CDW.

Pell Grants: Pell grants awarded are determined from Pell Grant records. Dollar values are in 2013 dollars unless noted otherwise.

Earnings: Earnings are defined as Medicare wages plus self-employment earnings. Dollar values are in 2013 dollars unless noted otherwise. This variable is created from W-2 tax data using the CDW.

Enrollment: Enrollment is determined by the NSLDS. Schools are required to report enrollment through the Student Status Confirmation Report within 30 days of a change in enrollment status according to Federal Regulation 34 CFR 682.610.[34]

School Types: Are identified using the ownership control type of the first institution at which a student borrowed. School types are defined as public, private, or for-profit and two or four year and by the institution to which the loan was originated.

Entry/Repayment Year: Entry years are assigned based on the fiscal year during which borrower's first loans were originated. Repayment year is defined by the fiscal year during which borrower's last loan enters into repayment, and all loans are in repayment.

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[33] See HHS Poverty Guidelines for details.
[34] For more on enrollment compliance, see the Enrollment Reporting Guide.

School Selectivity: Source: Barron's Profiles of American Colleges. 2008. Among 4-year public and private institutions we compress the Barron's Profiles categories into three groups: non-selective (corresponding to Barron's "Non-competitive and Less Competitive"); somewhat selective ("Competitive") and selective ("Very Competitive, Highly Competitive, and Most Competitive).

APPENDIX B

Data Appendix

The tabulations of NSLDS data underlying most of the charts and tables or otherwise described in the text and the program files that produce the charts and tables are available as a data appendix. These databases summarize the information on borrowers included in the merged ED/Treasury database by institutional type using three temporal concepts: the time of entry (characteristics of new borrowers in the year the borrower first entered the loan system), by fiscal year (characteristics of all borrowers with outstanding loan balances), and by repayment cohort (characteristics of borrowers in the year they entered repayment plus loan and economic outcomes subsequent to entering repayment).

Most figures in the text are derived directly from these databases, and readers may use the same data (and programs) to recreate those figures and to construct alternatives (e.g. means instead of medians; comparisons between alternative or multiple years etc.) These databases also provide a broader range of demographic, institutional, economic, and loan-related variables than directly described in the text. In particular, these data provide detail on:

New Borrowing and Entry into Repayment

The appendix data provide information on the number of borrowers, the amount borrowed, the number entering into borrowing for the first time, and when they entered into repayment. For instance, the data show that the number of borrowers entering repayment increased sharply from 1.4 million in 2007 to 2.4 million in 2011 and 2.9 million in 2013. As a result, the volume of debt entering repayment in 2013 ($89 billion) was almost three times the amount in 2007 ($33 billion).

Educational Outcomes of Borrowers

The NSLDS data include institution-reported indicators of whether a borrower has completed (graduated) from their program of study or withdrawn (i.e. without a degree). While most institutions appear to report completion and withdrawal accurately, the sole purpose of the reporting is to indicate to FSA that a student is no longer enrolled and there is no consequence to differentiating between the two options. Some institutions appear to use them interchangeably or to report only withdrawals. To supplement this measure, we also estimate the fraction of new borrowers who enter repayment within

one year of starting borrowing. These borrowers are unlikely to have completed their programs, even at 2-year institutions (Bound, Lovenheim and Turner (2010)). These data show that more than half of borrowers at 2-year for-profit institutions have attended for a year or less, as had about 35 percent of borrowers at 2-year public and 4-year for-profit institutions. In contrast, less than 15 percent of borrowers at 4-year public and private institutions dropped out after one year. Because borrowers may re-enter school, some spells of enrollment are censored in the last several years, increasing the share of short-term enrollments. As a result of the shifting enrollment patterns, many more borrowers have attended institution types where dropping out is the norm, hence, the fraction of borrowers in recent cohorts who have not completed their programs has increased.

Loan Amounts

The data appendix provides the estimates of the average and median loan balances of borrowers in their first year by entry cohort, in the year that the loan entered repayment (by repayment cohort), and for the overall stock of borrowers in each fiscal year. This also includes the 25th, 75th, and 95th percentiles. In addition, it provides the average and median amount owed by students for undergraduate and graduate loans.

Characteristics of Borrowers

The data appendix provides additional information on the characteristics of borrowers at entry, repayment, and in each fiscal year. These data are drawn from information provided as of the first FAFSA application provided by the student. Figure 4 provides further information on the age and income distribution of borrowers and t provides further demographic information.

Labor market outcomes

The data tables by repayment cohort and for borrowers by fiscal year provide estimates of mean and median earnings and income (based on modified AGI defined as AGI plus adjustments) and the fraction not employed or in poverty (based on their income and filing status) for repayment cohorts two years after entering repayment and for the stock of borrowers in repayment.

APPENDIX C: Decomposition Method

To determine the effect of individual characteristics, we use variations on the Oaxaca-Blinder de-composition. The standard Blinder (1973); Oaxaca (1973) framework for decomposition analysis imposes a linear framework. Let Y^j be the default rate in year j, and let X^j be a vector of explanatory variables including a constant row of ones in year j, and moreover let $\hat{\beta}^{11}$ be the coefficient from the

regression $Y^{11} = \hat{\beta}^{11} X^{11} + \varepsilon$.[35] In this case, the analysis is straightforward and the effect of a particular explanatory variable between 2011 and 2000 is measured using the change in the mean of an explanatory variable multiplied by the coefficient from a linear regression: $[\bar{X}^{11} - \bar{X}^{00}]\hat{\beta}^{11}$.

The decomposition is used to determine what default rates would have been in 2011 if the cohort had the same characteristics as individuals who were repaying loans in 2011. The estimated composition effects due to changes in observable characteristics solely reflect the effect of differences in the distribution of characteristics between borrowers in 2000 and 2011 under the following assumptions: (i) simple counterfactual treatment (ii) overlapping support and (iii) conditional independence.[36]

The linear framework is not ideal for decomposing the change in student loan defaults for two reasons. First, the gap in loan defaults lies in the tail of the distribution, where linear estimators tend to perform poorly. Second, there are large gaps between different years in a number of explanatory variables such as the total amount borrowed. This can lead to predicted probabilities below zero or above one in the linear framework. In a nonlinear framework, the change in the mean of an explanatory variable cannot simply be multiplied by the regression coefficient because for any non-linear function $F(.), E[Y] \neq F(E[\bar{X}\,\hat{\beta}])$.

Simulating the change in all observables can be done using a logit decomposition, assuming that the dependent variable is of the form $Y_F = F(X\beta) = \dfrac{e^{X\hat{\beta}}}{1+e^{X\hat{\beta}}}$.[37] The procedure is implemented by first estimating the default logit regression $Y = F(\hat{\beta}X)$ using the pooled data and then using the predicted $\hat{\beta}$ to simulate the counterfactual predicted default rate using the 2011 explanatory variables. The decomposition can thus be written as

$$\bar{Y}_F^{11} - \bar{Y}_F^{00} = \left[\sum_{i=1}^{N^{11}} \frac{F(\hat{\beta}^{11}X_i^{11})}{N^{11}} - \sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00}X_i^{00})}{N^{00}}\right] + \left[\sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00}X_i^{11})}{N^{00}} - \sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00}X_i^{00})}{N^{00}}\right]$$

The first term in brackets is the part of the change in defaults due to changes in the distribution of

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[35] Y^j is an $N^j \times 1$ vector, X^j is an $N^j \times K$ matrix of independent variables and $\hat{\beta}^j$ is a $K \times 1$ vector of coefficients. K denotes the number of variables N^j, the number of observations and j the year.

[37] The logit model has the desirable property that if a constant term is included, the predicted values of the logit model in year i will be $\bar{Y}^i$.

observables X between 2000 and 2011. The second term in brackets is the part of the change in defaults that is not explained by changes in the distribution of observables. The default logit regression also provides a framework for analyzing the factors that influence the default decision, and whether or not they have changed since the seminal study on student loans by Knapp and Seaks (1992). The above framework allows us to estimate the total change in defaults due to compositional changes in observables; it is also possible to estimate the effect of changes in individual explanatory variables such as the total amount borrowed and earnings following Yun (2004).[38]

Contributions of a single variable can be obtained by weighing the contribution of each variable, constructing weight by evaluating the value of a function using mean characteristics and then linearizing the coefficients and characteristics around the predicted values in each year. The decomposition equation is thus given by

$$\bar{Y}_F^{11} - \bar{Y}_F^{00} =$$

$$\sum_{t=1}^{t=K} W_{\Delta X}^t \left[\sum_{i=1}^{N^{11}} \frac{F(\hat{\beta}^{11} X_i^{11})}{N^{11}} - \sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00} X_i^{00})}{N^{00}} \right] + \sum_{t=1}^{t=K} W_{\Delta \beta}^t \left[\sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00} X_i^{11})}{N^{00}} - \sum_{i=1}^{N^{00}} \frac{F(\hat{\beta}^{00} X_i^{00})}{N^{00}} \right]$$

Where K is the number of variables and $W_{\Delta X}^t = \frac{(\overline{X_t^{11}} - \overline{X_t^{00}}) \beta_t^{11}}{(\overline{X^{11}} - \overline{X^{00}}) \beta^{11}}$. Note that the t subscript refers to an individual characteristic.

The aim of the decomposition is to determine what default rates would have been in 2011 if the cohort had the same characteristics as individuals who were repaying loans in 2000. In regard to this point, the estimated composition effects due to changes in observable characteristics solely reflect the effect of differences in the distribution of characteristics between borrowers in 2000 and 2011 if the following assumptions are met: (i) simple counterfactual treatment (ii) overlapping support and (iii) conditional independence. Overlapping support is trivially satisfied in the context of the NSLDS as no single variable predicts whether or not an individual was surveyed in the 2000 cohort or the 2011 cohort. The simple counterfactual assumption, whether or not another counterfactual default structure exists, is also satisfied as there are unlikely to be significant general equilibrium effects between individuals across the two surveys,[39] The conditional independence assumption, often called *unconfoundedness* or *selection on observables* is a somewhat stronger assumption and warrants further discussion.

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[38] An alternative is the Fairlie (1999) or Bound, Lovenheim and Turner (2010) counterfactual simulation procedure.
[39] The validity of the simple counterfactual assumption rests on whether or not another counterfactual default structure exists. Other counterfactuals may exist due to general equilibrium effects, for example, Fortin, Lemeiux, and Firpo (2010) use the example of a counterfactual wage structure in which there are no unions in the labor

The conditional independence assumption is satisfied if the errors are independent of belonging to each year of the NSLDS conditional on observables. This is a threat to identification if unobservable determinants of default have changed between 2000 and 2011, or if individuals have selected into borrowing across years based on different unobservable characteristics. While it is impossible to observe unobservables, the results in table 9 provide some evidence that at least the relationship between observables and default has remained similar during the two sample periods. Table 8 indicates that the relationship between observable characteristics remains similar in sign and magnitude between 2000 and 2011. The framework and incentives of student loan programs also remained largely similar in both samples, making it unlikely that students selected into borrowing based on different unobserved characteristics in 2000 and in 2011.[40] Table 9 indicates that, for observables, there is no evidence that the determinants of default and borrowing changed.

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market. This could violate the simple counterfactual assumption as the presence of unions are likely to have general equilibrium effects on wages.

[40] The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 reformed private student loans, where this study focuses on default in Federal student loans. Wage garnishment rates increased from 10% to 15% in 2006 as part of the Deficit Reduction Act of 2005, however we focus on loans taken in the first year of enrollment prior to the increase in garnishment amounts. If the garnishment had any effect on the adverse selection of riskier borrowers, this would cause the decomposition results to underestimate the impact of the increase in total borrowing on default rates.

Figure 1: U.S. Two-Year Cohort Default Rate 1972-2012
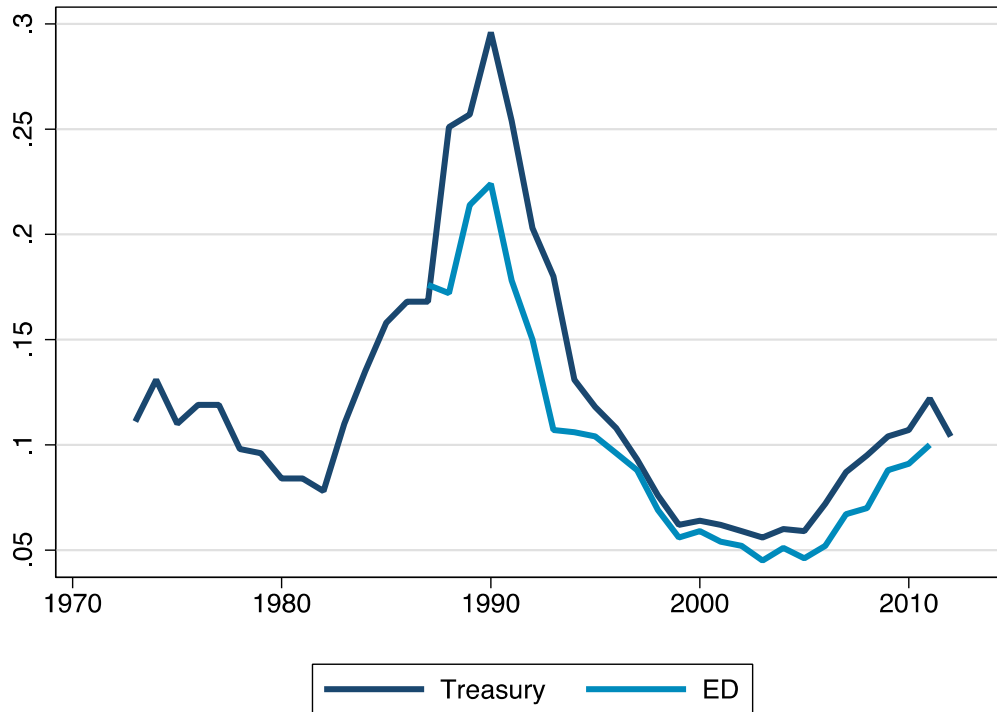
Notes: This figure compares the official two year cohort default from 1992-2010 (dark blue) rate with our replication based on the 4 percent NSLDS extract (light blue). In our replication, the two year cohort default rate is the fraction of federal student loan borrowers entering repayment on all federal loans who default by the end of the next fiscal year after the fiscal year entered repayment. Cohorts are defined by fiscal year entered repayment.

Figure 2: First-Time Borrowers and Borrowers Entering Repayment by Institution Type
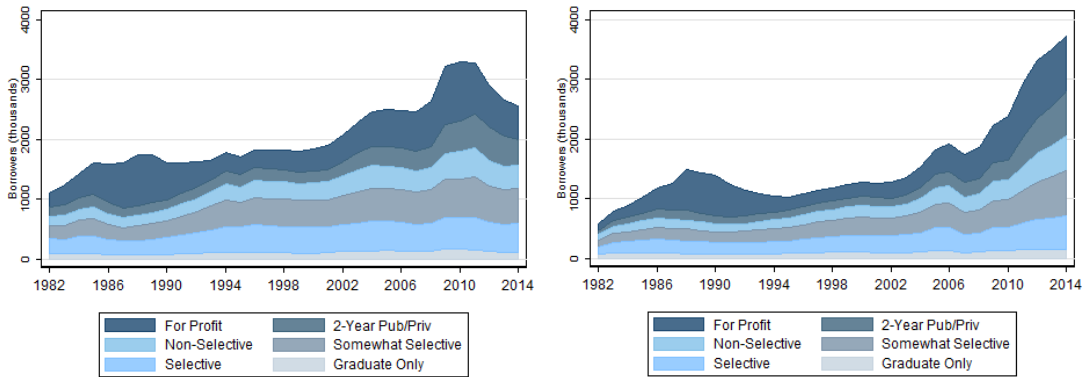
Notes: The left panel shows the number of new first-time federal borrowers (in thousands) in each fiscal year by institution type and selectivity of the institution first attended (defined by Barron's—see text). (Types: for-profit; 2-year public and private; non-selective, selective, and most-selective 4-year public and private; and graduate-only borrowers (those taking out only graduate loans). The right hand panel of this figure shows the total number of borrowers entering repayment on 100 percent of their federal loans (i.e. on the last loan to enter repayment) each fiscal year, by the same institution types. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 3: Where Students Borrowed: Borrowers Entering Repayment by Institution Type, 2000 and 2011
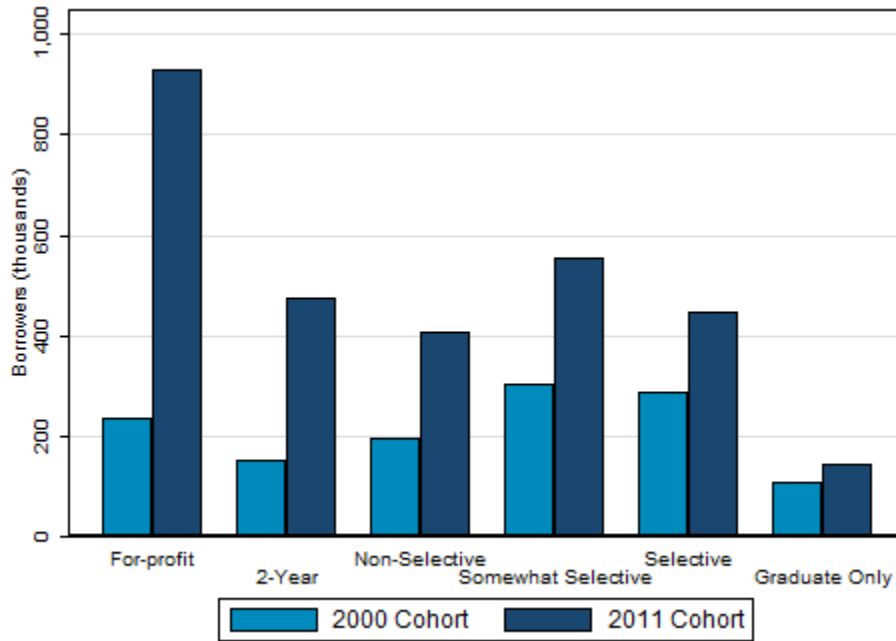
Notes: This figure shows the total number of borrowers (in thousands) entering repayment on all federal student loans in 2000 (dark blue) and in 2011 (light blue) by institution type. Cohorts are defined by fiscal year entered repayment. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 4: Characteristics of Borrowers in 2011 by Institution Type
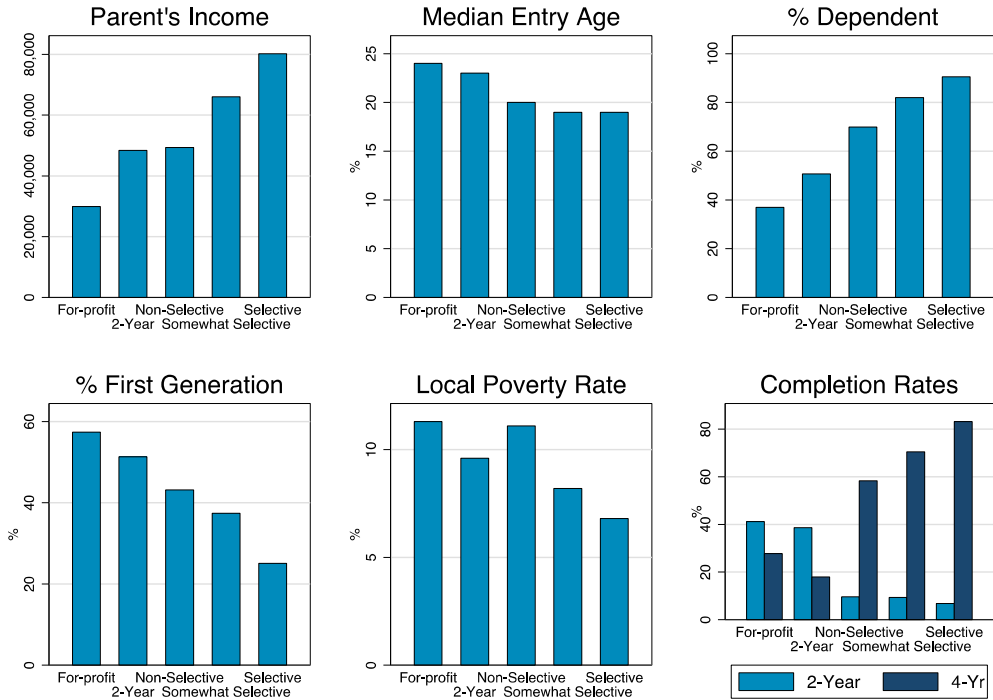
Notes: The figure examines how changes in enrollment and borrowing patterns at different institutions affect the characteristics of borrowers in the aggregate. Each panel presents a cross sectional comparison of borrowers who started borrowing as undergraduates at each institution type. The top left panel shows median family income (the parent's income) of dependent undergraduate borrowers (in 2013 dollars). The top middle panel shows the median age of borrowers in the year they first borrowed. The top right panel shows the fraction of borrowers who were deemed dependent undergraduates in their financial aid applications in the year first borrowed. The bottom left panel shows the fraction of students reporting that neither of their parents had completed post-secondary education on their initial application for federal aid. The bottom middle panel shows the average poverty rate each student's zip code based on the 2000 Census and the first application for federal aid. The bottom right panel shows the average institution-reported completion of borrowers by degree type (two year or four year). Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 5: Unemployment Rates of Federal Borrowers in Second Year of Repayment
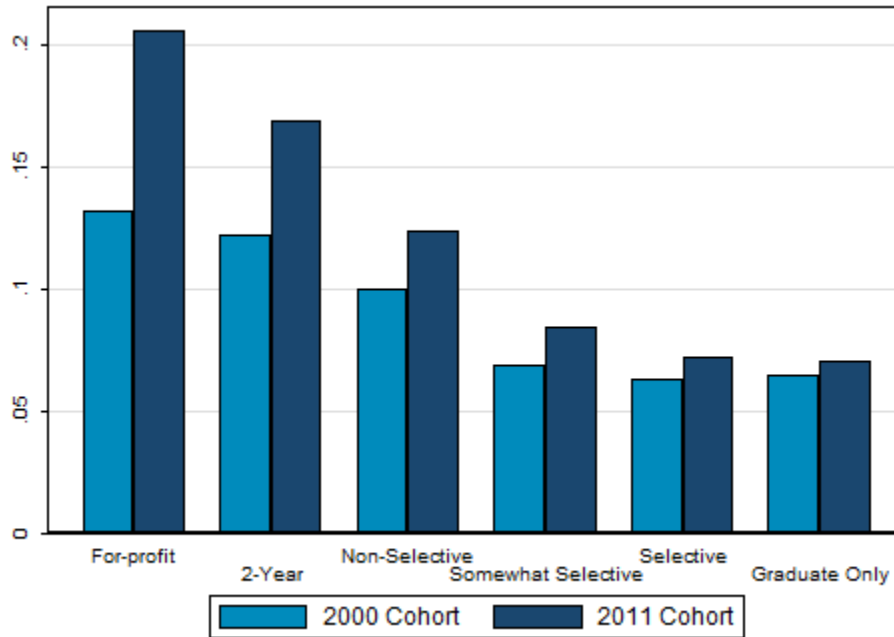
Notes: This figure shows the fraction of borrowers with less than $100 of earnings two years after having entered repayment on all federal loans. The figure compares the outcomes of the 2000 cohort (light blue) in calendar year 2002 and the 2011 cohort (dark blue) in calendar year 2013. Cohorts are defined by fiscal year entered repayment. Earnings defined as W-2 reported wage income plus deferred compensation plus any earnings reported on Schedule SE. Source: Treasury tabulations of 4 percent NSLDS sample matched to de-identified tax records.

Figure 6: Median Earnings of Employed Federal Borrowers in Second Year of Repayment
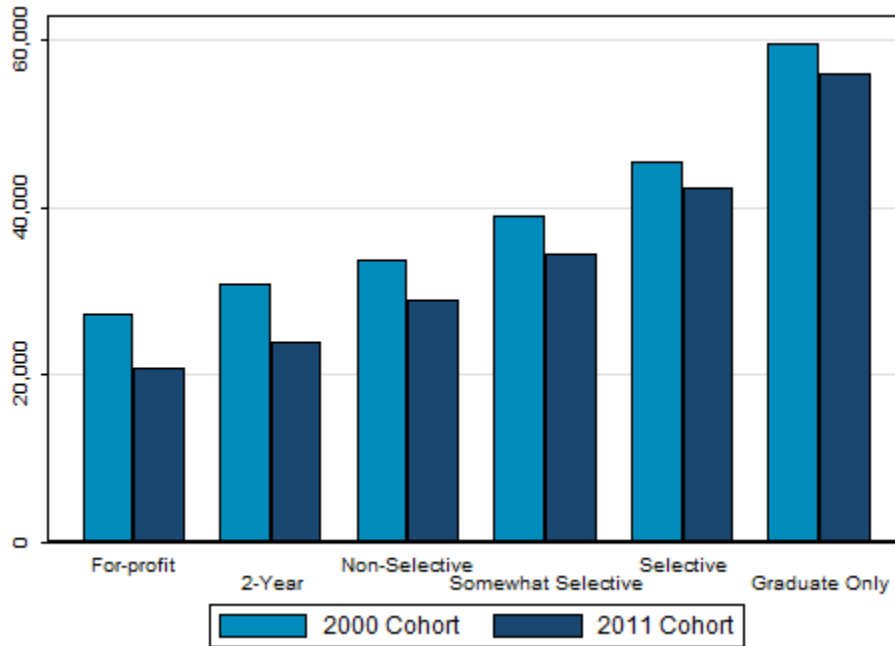
Notes: This figure shows median earnings of borrowers two years after having entered repayment on all federal loans. The figure compares the outcomes of the 2000 cohort (light blue) in calendar year 2002 and the 2011 cohort (dark blue) in calendar year 2013 in 2013 inflation-adjusted dollars. Cohorts are defined by fiscal year entered repayment. Earnings defined as W-2 reported wage income plus deferred compensation plus any earnings reported on Schedule SE. Source: Treasury tabulations of 4 percent NSLDS sample matched to de-identified tax records.

Figure 7: Changes in Federal Student Loan Indebtedness: Median Borrowing by Institution Type
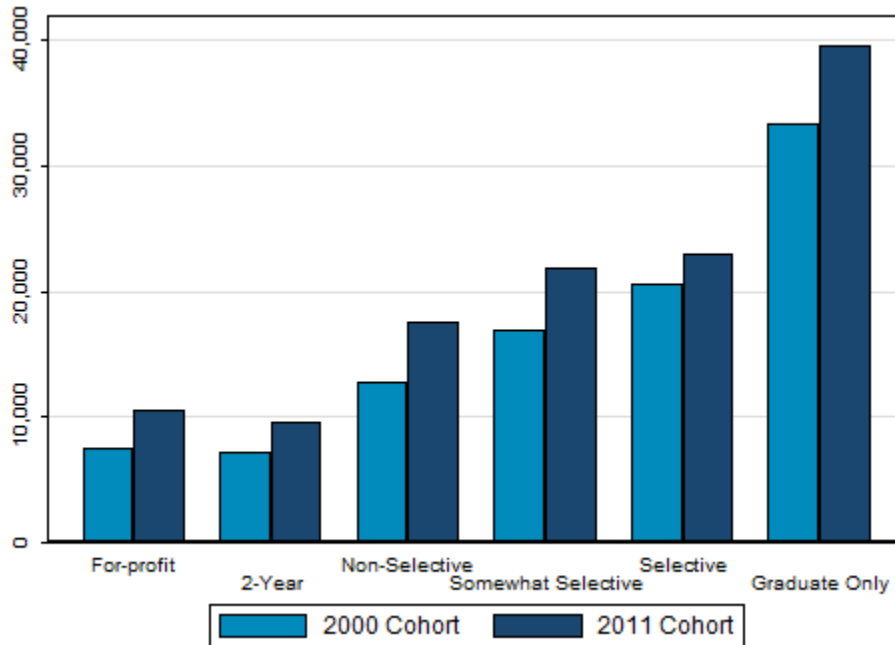
Notes: This figure shows median federal student loan debt of borrowers entering repayment on all federal loans in a given year in 2000 (light blue) and 2011 (dark blue) by institution type. Cohorts are defined by fiscal year entered repayment. Dollar values adjusted for inflation to 2013. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 8: Annual Borrowing Amounts by Institution Type (Nominal Dollars)
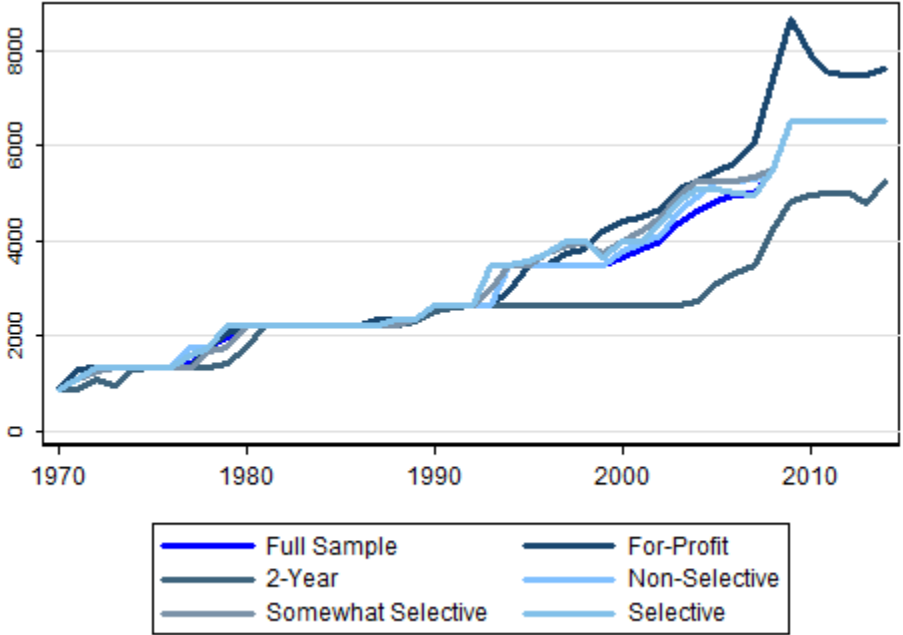
Notes: This figure shows the median amount of federal loans students borrowed each year by institution type for undergraduate students. The levels of annual borrowing closely reflect changes in dependent and independent federal loan limits. All dollar values are in nominal terms. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 9: Historical Three-Year Cohort Default Rates by Institution Type
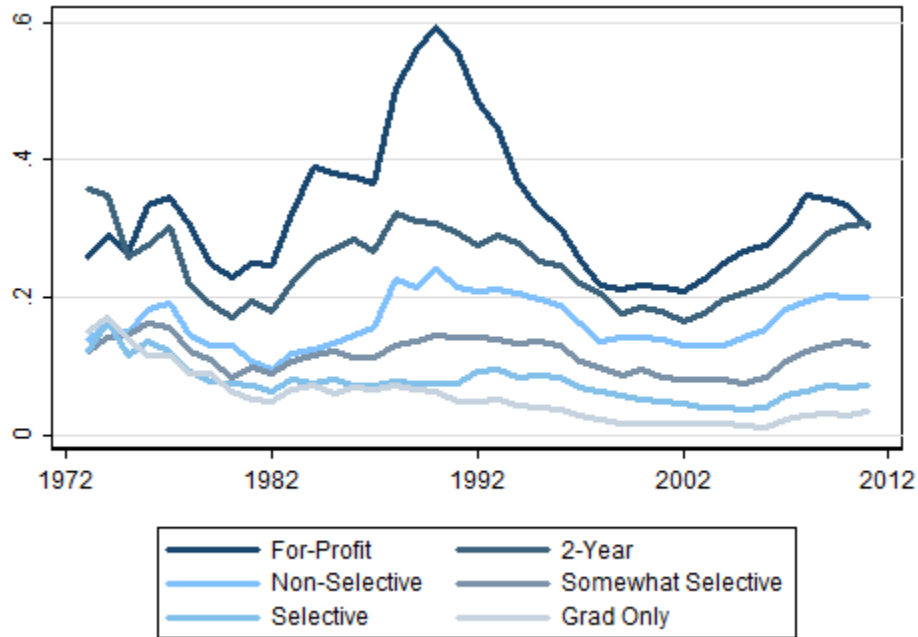
Notes: This figure compares historical three-year cohort default rates by institution and selectivity type for for-profit (dark blue); 2-year public and private (medium blue); non-selective 4-year public and private (light grey); selective 4-year (dark grey); most selective 4-year (light blue); and graduate-only borrowers (grey). The three-year cohort default rate is defined as the fraction of borrowers entering repayment (on all loans) in each fiscal year who subsequently enter default by the end of the fiscal year two years later. Cohorts are defined by fiscal year entered repayment. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 10: Increases in Cohort Default Rates by Institution Type
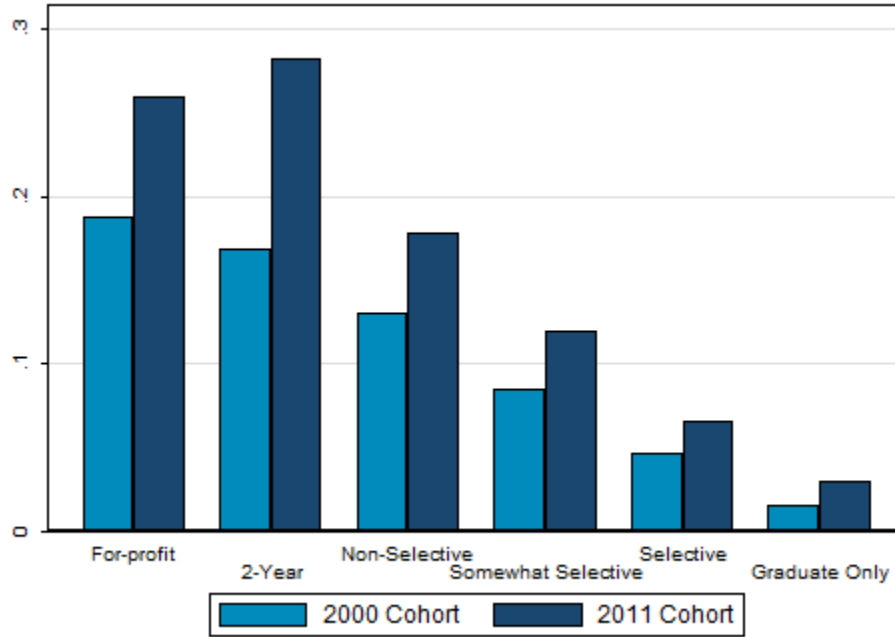
Notes: This figure compares the three-year cohort default rates for the 2000 repayment cohort (light blue) to the 2011 repayment cohort (dark blue) by institution type. The three year cohort default rate is defined as the fraction of borrowers who go into default within two years of entering repayment. The three-year cohort default rate is defined as the fraction of borrowers entering repayment (on all loans) in each fiscal year who subsequently enter default by the end of the fiscal year two years later. Cohorts are defined by fiscal year entered repayment. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 11: The Relationship between Student Debt and Student Earnings
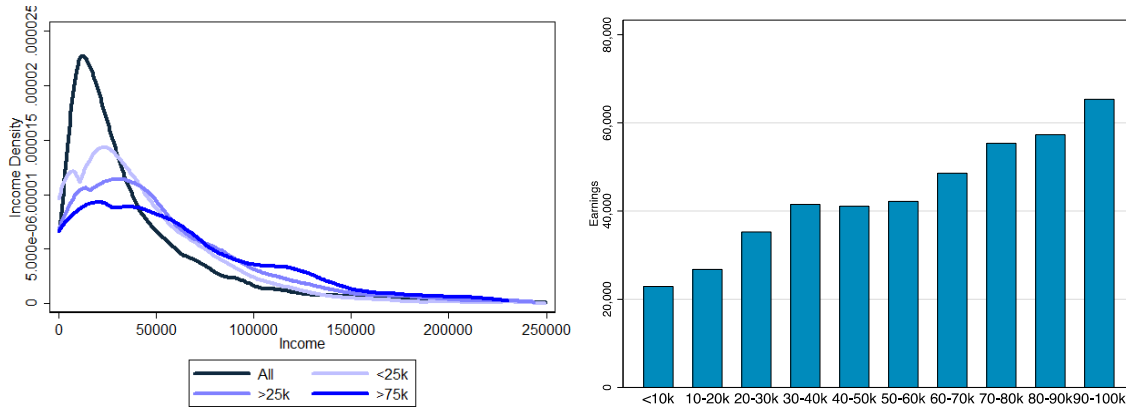
Notes: The panel on the left the earnings of borrowers with different levels of student loan debt. The figure shows kernel-density estimates of the earnings distributions of borrowers with different levels of debt to the population of earnings (with and without debt). The dark navy line shows estimates of the distribution of all individuals with reported earnings (between the ages of 25 and 34). The lightest blue line shows the distribution of borrowers with less than $25,000 in debt. The slightly darker line shows the density of borrowers with more than $50,000 in debt and the next darkest line shows borrowers with more than $75,000 in debt. The figure shows that borrowers have substantially higher earnings than the population in general and that borrowers with higher levels of debt tend to have higher earnings. The panel on the right shows mean earnings two years after entering repayment by the repayment balance. All dollar values are in 2013 dollars. Source: Treasury tabulations of 4 percent NSLDS sample matched to de-identified tax records.

Figure 12: Increases in Large Balances: The Distribution of Loan Balances by Cohort
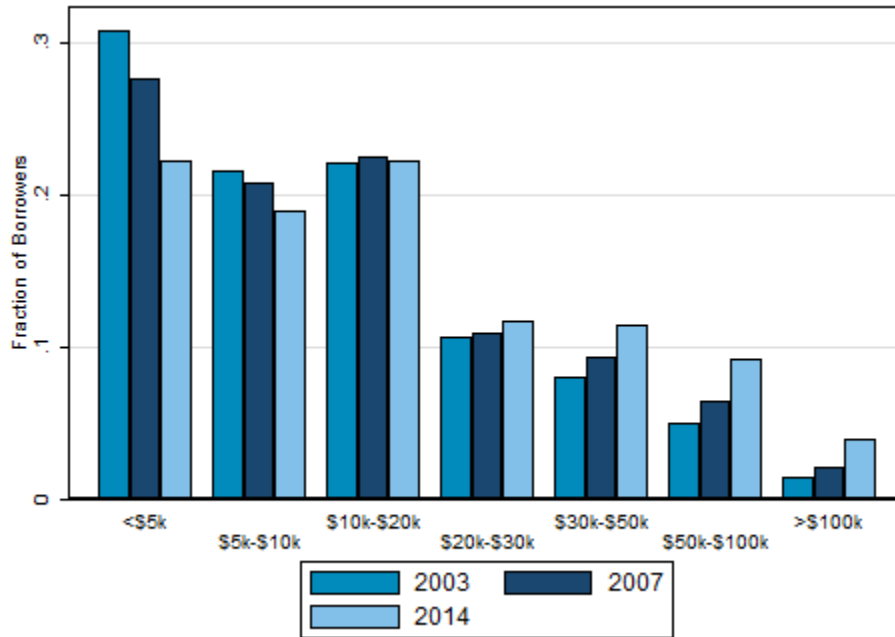
Notes: This figure shows the percentage of federal borrowers at each level of indebtedness (defined on the x-axis) for the 2003 (medium blue), 2007 (dark blue) and 2013 (light blue) repayment cohorts. Cohorts are defined by fiscal year entered repayment. Dollar values adjusted for inflation to 2013. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 13: The Evolution of Debt Burdens over a Career: Median Debt-Service to Earnings

All Borrowers   **Traditional Borrowers**
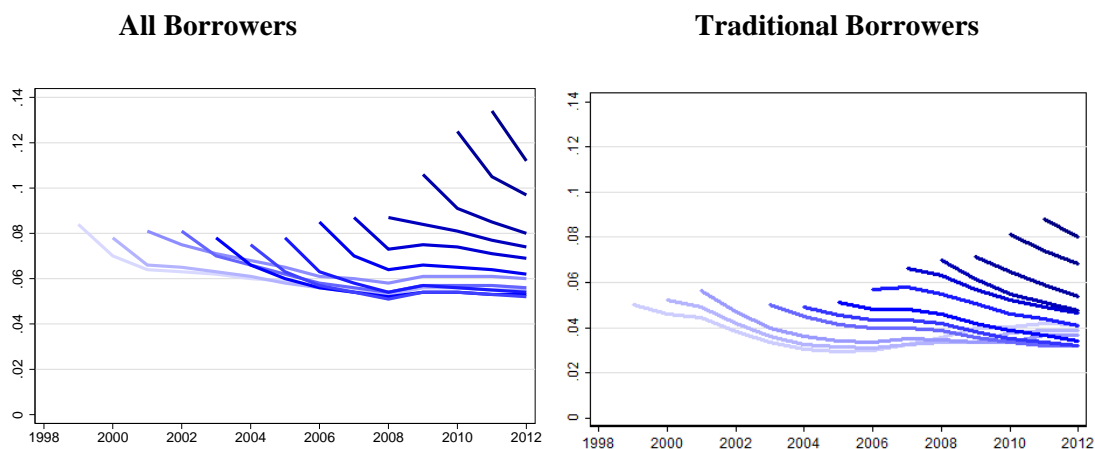
Notes: This figure shows the debt-service to earnings ratio of the median borrower by repayment cohort and fiscal year. Debt service is defined using a fixed 10-year amortizing loan payment and the applicable student loan interest rate for each student calculated in the year each student entered repayment on all loans. The ratio is defined using the fixed debt service level to the actual earnings of the borrowers in each subsequent year. For instance, the lightest blue line shows the estimated debt-service to earnings of the 1999 repayment cohort in each year from 1999 to 2013 using the fixed debt service amount and the empirical earnings for each of those years. Cohorts are defined by fiscal year entered repayment. The figure illustrates that debt-service to earnings ratios are relatively high in the first and second year of repayment (when earnings are relatively low) and then decline more slowly thereafter. In addition, it shows that initial debt-service to earnings ratios were relatively constant between 1999 and 2006, but then increased sharply, particularly after 2010 as debt levels increased and earnings declined. The left panel shows all borrowers, and the right panel shows traditional borrowers at four-year institutions. Source: Treasury tabulations of 4 percent NSLDS sample matched to de-identified tax records.

Figure 14: Changes in the Stock of Borrowers: Flows into and out of indebtedness
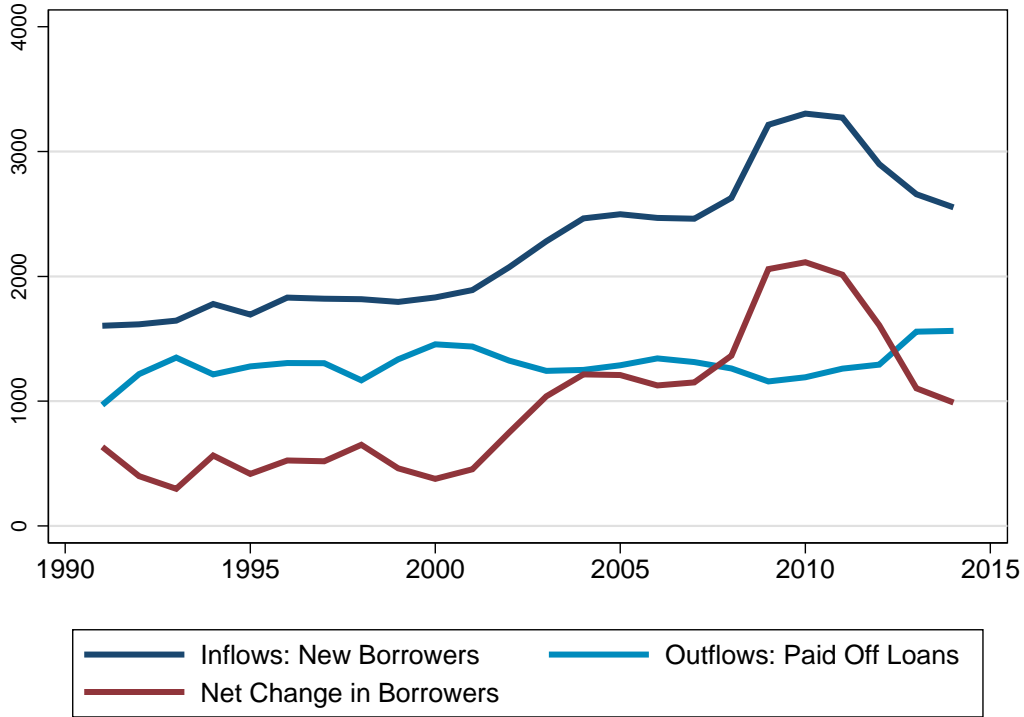
Notes: This figure shows the number of borrowers (in thousands) taking out loans for the first time the (dark-blue line), paying off loans entirely (the light-blue line), and the net change in total borrowers (the red line) each fiscal year. The rate of new borrowing increased in the early 2000s and jumped during the recession, while the rate at which borrowers repaid loans was relatively constant. The result is that the annual increase in the number of federal loan borrowers exceeded 1 million each year starting in 2003 and exceeded 2 million each year starting in 2009. Subsequent to the end of the recession, the rate of increase dropped to 1 million in 2014. Source: Treasury tabulations of 4 percent NSLDS sample.

Figure 15: Slowing Rates of Repayment: Median Balance Remaining by Cohort and Year

All Borrowers **Traditional Borrowers**
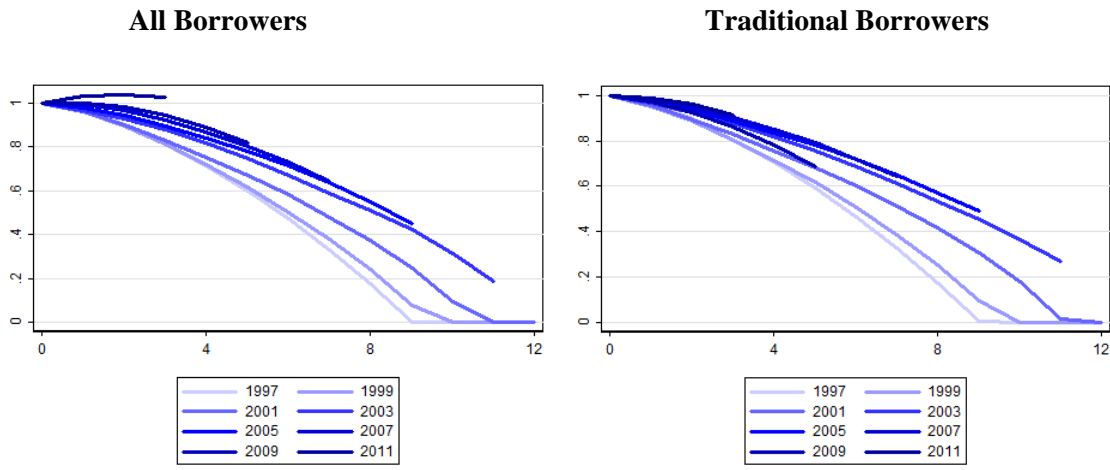
Notes: This figure shows the fraction of the initial federal loan balance remaining in each subsequent fiscal year for the median borrower in selected repayment cohorts from 1997 to 2011. Cohorts are defined by fiscal year entered repayment. The figure shows that the median borrower in the 1997 repayment cohort had repaid his or her loan in the 9th year after entering repayment; for the 1999 cohort it took 10 years. The left panel shows all borrowers, and the right panel shows traditional borrowers at four-year institutions. Source: Treasury tabulations of 4 percent NSLDS sample.

Table 1: Aggregate Loan Volume and Number of Borrowers by Loan Type

Fiscal Year	Total Balance	% Undergrad	% Grad	% Parent	Total Borrowers	% Undergrad	% Grad & Undergrad	% Grad Only	% Parent
1985	$64,406	76%	23%	1%	8,919	84%	6%	8%	2%
1986	$72,403	76%	23%	2%	10,193	84%	6%	8%	2%
1987	$79,209	75%	23%	2%	11,411	85%	6%	8%	2%
1988	$87,330	75%	23%	2%	12,714	85%	5%	7%	3%
1989	$95,156	74%	23%	3%	13,938	84%	5%	7%	3%
1990	$101,450	73%	24%	3%	14,896	84%	5%	7%	4%
1991	$109,914	72%	25%	4%	15,577	83%	5%	7%	5%
1992	$118,315	70%	25%	4%	16,035	83%	5%	7%	5%
1993	$130,637	70%	26%	5%	16,402	82%	5%	7%	6%
1994	$150,137	68%	27%	5%	17,058	82%	5%	7%	6%
1995	$172,258	67%	27%	5%	17,585	81%	5%	7%	6%
1996	$196,827	66%	28%	6%	18,270	81%	5%	7%	7%
1997	$225,185	65%	29%	6%	18,939	81%	6%	7%	7%
1998	$258,336	65%	29%	6%	19,934	80%	6%	7%	7%
1999	$286,876	65%	29%	6%	20,563	80%	6%	7%	7%
2000	$311,449	64%	30%	7%	21,063	79%	7%	7%	7%
2001	$340,945	63%	30%	7%	21,661	79%	7%	7%	8%
2002	$369,617	63%	30%	7%	22,590	78%	7%	7%	8%
2003	$404,376	62%	30%	7%	23,846	78%	8%	7%	8%
2004	$441,283	61%	31%	8%	25,285	77%	8%	7%	8%
2005	$478,881	61%	31%	8%	26,745	77%	9%	6%	9%
2006	$525,178	60%	32%	8%	28,095	76%	9%	6%	9%
2007	$568,054	60%	32%	8%	29,478	76%	10%	6%	9%
2008	$634,453	59%	33%	8%	31,093	76%	10%	6%	9%
2009	$706,894	59%	33%	8%	33,480	76%	10%	6%	9%
2010	$791,637	59%	33%	8%	35,949	76%	11%	6%	9%
2011	$878,741	59%	33%	8%	38,301	75%	11%	6%	9%
2012	$966,236	59%	33%	8%	40,174	76%	11%	6%	9%
2013	$1,050,000	59%	33%	8%	41,529	76%	11%	6%	8%
2014	$1,130,000	59%	34%	8%	42,760	76%	11%	6%	8%

Notes: Total balances and total number of borrowers as of the end of each fiscal year. % undergrad is the share with only undergraduate balances; % grad is the share with only graduate balances; % both is the share with both. Parent refers to Parent PLUS loans. Loan balances in thousands (in 2013 dolars). Source: US Treasury tabulations of 4 percent NSLDS sample.

Table 2: Undergraduate Enrollment and Borrowing in Different Data Sources

	NCES Enrollment				NSLDS Borrowers				NSLDS Originations and Balances	
	First-Time Enrollment		Total Fall Enrollment		First-Time Borrowers		Total Active Borrowers		Active Originations	
	2000	2011	2000	2011	2000	2011	2000	2011	2000	2011
Panel A: Students, Borrowers, and Loan Amounts										
Public 2- Year	0.53	0.71	5.7	7.06	0.184	0.559	0.38	1.41	$ 1.6	$ 8.7
Public 4-Year	0.8	1.06	4.84	6.63	0.646	0.99	1.98	3.25	$ 12.2	$ 24.2
Private	0.44	0.51	2.21	2.72	0.389	0.512	1.14	1.70	$ 7.6	$ 13.6
For-Profit	0.2	0.29	0.4	1.66	0.309	0.764	0.55	2.17	$ 3.6	$ 18.0
Total	1.98	2.57	13.16	18.06	1.528	2.825	4.05	8.54	$ 24.9	$ 64.5
Panel B: Shares of Students, Borrowers, and Loan Amounts										
Public 2-Year	27%	28%	43%	39%	12.0%	19.8%	9.3%	16.6%	4%	8%
Public 4-Year	40%	41%	37%	37%	42.3%	35.0%	48.8%	38.1%	44%	38%
Private	22%	20%	17%	15%	25.5%	18.1%	28.2%	19.9%	40%	30%
For-Profit	10%	11%	3%	9%	20.2%	27.0%	13.6%	25.4%	12%	24%

Panel C: Ratios of Borrowers per Student, Originations per Students, and Originations per Borrower

	Borrowers/Student				Originations/Student		Originations/Borrower	
	New Students (FT)		All Students (FT+PT)					
	2000	2011	2000	2011	2000	2011	2000	2011
Public 2- Year	35%	79%	7%	20%	$ 277	$ 1,226	$ 4,194	$ 6,121
Public 4-Year	81%	93%	41%	49%	$ 2,519	$ 3,649	$ 6,172	$ 7,436
Private	88%	100%	52%	63%	$ 3,431	$ 5,000	$ 6,639	$ 8,000
For-Profit	155%	263%	138%	131%	$ 8,938	$10,861	$ 6,477	$ 8,312
Total	77%	110%	31%	47%	$ 1,894	$ 3,570	$ 6,162	$ 7,553

Notes: Column (1)-(2) show first-time, full-time undergraduate enrollment (from NCES) by institution type by academic year (in millions). Columns (3)-(4) show total fall undergraduate enrollment in Title IV programs (from NCES) by institution type (millions). Columns (5)-(6) show the number of first-time federal undergraduate student loan borrowers (from NSLDS tabulations) in millions of borrowers. Columns (7)-(8) show total active undergraduate borrowers receiving undergraduate loan disbursements that fiscal year (in millions) (from NSLDS tabulations). Columns (9)-(10) show aggregate federal undergraduate loan originations in billions of 2013 dollars (from NSLDS tabulations). Panels A provides source data. Panel B divides panel A by totals to produce shares. Sources: First-Time Full-Time Enrollment: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survey, Table 331.20. Full Time Enrollment: National Center for Education Statistics, Higher Education General Information Survey, Table 303.70 (degree-granting institutions only). Degree-granting institutions included are those that grant associate's or higher degrees and participate in Title IV federal financial aid programs. New borrowers, active borrowers and originations: US Treasury tabulations of NSLDS 4 percent sample. Originations include all loans disbursed on behalf of undergraduate students (excluding Parent PLUS loans).

Table 3: The Number of Federal Borrowers by Institution Type

Fiscal Year	Total	For Profit	2-Year	Non-Selective	Somewhat Selective	Selective	Graduate Only
1985	8,919	1,760	1,006	1,254	1,908	2,266	727
1986	10,193	2,328	1,147	1,387	2,092	2,449	790
1987	11,411	2,999	1,236	1,497	2,244	2,592	841
1988	12,714	3,748	1,316	1,625	2,395	2,730	898
1989	13,938	4,407	1,391	1,746	2,563	2,872	953
1990	14,896	4,849	1,445	1,853	2,719	3,015	1,009
1991	15,577	5,081	1,491	1,951	2,878	3,116	1,054
1992	16,035	5,166	1,518	2,044	3,017	3,197	1,087
1993	16,402	5,098	1,551	2,144	3,191	3,296	1,117
1994	17,058	5,079	1,625	2,283	3,426	3,463	1,177
1995	17,585	5,018	1,681	2,410	3,626	3,607	1,234
1996	18,270	4,973	1,745	2,566	3,874	3,808	1,289
1997	18,939	4,934	1,819	2,721	4,115	3,996	1,337
1998	19,934	4,986	1,922	2,925	4,430	4,262	1,393
1999	20,563	4,954	1,965	3,075	4,673	4,454	1,423
2000	21,063	4,941	1,986	3,212	4,860	4,599	1,446
2001	21,661	4,994	2,027	3,366	5,054	4,735	1,464
2002	22,590	5,143	2,134	3,560	5,307	4,918	1,506
2003	23,846	5,410	2,296	3,803	5,617	5,136	1,562
2004	25,285	5,795	2,482	4,058	5,935	5,368	1,621
2005	26,745	6,207	2,669	4,300	6,263	5,613	1,654
2006	28,095	6,628	2,842	4,524	6,545	5,822	1,680
2007	29,478	7,103	3,014	4,747	6,820	5,995	1,751
2008	31,093	7,704	3,211	4,970	7,117	6,197	1,851
2009	33,480	8,584	3,553	5,279	7,526	6,501	1,996
2010	35,949	9,483	3,927	5,616	7,968	6,789	2,129
2011	38,301	10,149	4,373	6,001	8,430	7,068	2,245
2012	40,174	10,676	4,785	6,290	8,812	7,267	2,310
2013	41,529	11,017	5,078	6,511	9,120	7,424	2,349
2014	42,760	11,334	5,256	6,740	9,438	7,582	2,381

Notes: Total borrowers each fiscal year with outstanding federal loan balances, by institution type of first borrowing. Selectivity data comes from Barron's (see text). Graduate only refers to borrowers who started borrowing at the graduate level. Number of borrowers is in thousands. Source: US Treasury tabulations of 4 percent NSLDS sample.

Table 4: Aggregate Federal Student Loan Debt by Institution Type

Fiscal Year	Total	For Profit	2-Year	Non-Selective	Somewhat Selective	Selective	Grad Only
1985	$64,406	$8,024	$4,818	$10,119	$13,574	$18,880	$8,989
1986	$72,403	$10,536	$5,448	$11,226	$14,925	$20,464	$9,802
1987	$79,209	$13,537	$5,680	$12,151	$15,782	$21,492	$10,546
1988	$87,330	$17,534	$5,884	$13,212	$16,657	$22,492	$11,483
1989	$95,156	$21,070	$6,118	$14,289	$17,697	$23,473	$12,410
1990	$101,450	$22,973	$6,204	$15,124	$18,854	$24,796	$13,407
1991	$109,914	$24,451	$6,565	$16,439	$20,804	$26,771	$14,792
1992	$118,315	$25,146	$6,913	$17,895	$23,055	$28,890	$16,323
1993	$130,637	$25,954	$7,477	$20,009	$26,366	$32,240	$18,496
1994	$150,137	$26,682	$8,196	$23,348	$31,623	$38,075	$22,109
1995	$172,258	$27,378	$8,984	$27,166	$37,636	$44,798	$26,169
1996	$196,827	$28,483	$9,836	$31,511	$44,434	$52,132	$30,260
1997	$225,185	$30,029	$10,912	$36,765	$52,301	$60,341	$34,654
1998	$258,336	$34,055	$12,314	$43,531	$60,880	$68,705	$38,648
1999	$286,876	$36,797	$13,209	$49,069	$68,618	$76,536	$42,446
2000	$311,449	$38,884	$13,835	$54,344	$75,588	$83,056	$45,527
2001	$340,945	$42,358	$14,758	$60,587	$83,623	$90,473	$48,926
2002	$369,617	$46,571	$15,871	$66,889	$91,343	$97,508	$51,189
2003	$404,376	$52,075	$17,539	$74,253	$100,450	$105,906	$53,873
2004	$441,283	$59,011	$19,407	$81,540	$109,570	$114,345	$57,071
2005	$478,881	$66,497	$21,349	$88,940	$118,609	$122,852	$60,072
2006	$525,178	$76,147	$23,805	$98,057	$129,697	$132,633	$64,047
2007	$568,054	$86,264	$26,224	$106,226	$139,035	$140,387	$69,189
2008	$634,453	$102,191	$29,986	$118,214	$153,053	$152,682	$77,677
2009	$706,894	$122,567	$34,943	$130,155	$167,693	$164,811	$86,133
2010	$791,637	$146,138	$41,177	$144,435	$184,639	$179,093	$95,604
2011	$878,741	$169,641	$48,668	$159,985	$202,762	$192,735	$104,447
2012	$966,236	$191,105	$56,291	$176,116	$222,632	$207,459	$112,152
2013	$1,050,000	$209,768	$62,626	$190,722	$241,335	$221,008	$119,275
2014	$1,130,000	$228,542	$67,704	$206,208	$261,466	$234,910	$126,410

Notes: Total borrowers each fiscal year with outstanding federal loan balances, by institution type of first borrowing. Selectivity data comes from Barron's (see text). Graduate only refers to borrowers who started borrowing at the graduate level. Dollar values are in 2013 dollars and in thousands. Source: US Treasury tabulations of 4 percent NSLDS sample.

Table 5: Insitutions Ranked by Accumulated Federal Loans of their Students 2000 and 2014

Rank	Institution	Total Debt ($1000s)	Total Borrowers	Institution	Total Debt ($1000s)	Total Borrowers	5-Year CDR	% Balance Repaid
	2000			2014			2009 Cohort in 2014	
1	New York University	$ 2,184,601	72,650	University of Phoenix-Phoenix Campus	$ 35,529,283	1,191,550	45%	1%
2	University of Phoenix-Phoenix	$ 2,099,828	103,475	Walden University	$ 9,833,470	120,275	7%	0%
3	Nova Southeastern University	$ 1,736,919	34,900	Nova Southeastern University	$ 8,748,887	94,350	6%	-3%
4	Pennsylvania State University	$ 1,710,951	123,800	DeVry University-Illinois	$ 8,249,788	274,150	43%	-4%
5	University of Southern California	$ 1,609,511	51,525	Capella University	$ 8,043,635	104,450	19%	-5%
6	Ohio State University-Main Campus	$ 1,533,954	82,250	Strayer University-Global Region	$ 6,693,570	144,400	31%	-6%
7	Temple University	$ 1,531,762	59,900	Kaplan University-Davenport Campus	$ 6,664,067	220,125	53%	0%
8	Arizona State University-Main	$ 1,385,858	70,675	New York University	$ 6,307,264	110,775	6%	34%
9	Michigan State University	$ 1,321,997	65,650	Argosy University-Chicago	$ 6,179,207	104,325	15%	-7%
10	University of Minnesota-Twin Cities	$ 1,289,873	66,675	Ashford University	$ 5,891,799	205,000	47%	2%
11	Boston University	$ 1,289,257	50,850	Grand Canyon University	$ 5,881,420	145,850	36%	0%
12	The University of Texas at Austin	$ 1,264,226	64,650	Liberty University	$ 5,678,555	142,875	14%	14%
13	University of Florida	$ 1,186,645	52,050	University of Southern California	$ 5,340,123	83,400	5%	20%
14	University of California-Los Angeles	$ 1,159,430	54,975	Pennsylvania State University	$ 5,310,636	210,125	14%	21%
15	University of Michigan-Ann Arbor	$ 1,126,159	44,725	Arizona State University-Main Campus	$ 4,928,019	158,800	17%	12%
16	Columbia University	$ 1,120,001	31,225	ITT Educational Services Inc System Office	$ 4,618,538	191,225	51%	-1%
17	University of Pittsburgh-Pittsburgh	$ 1,106,448	48,925	Ohio State University-Main Campus	$ 4,362,143	132,725	12%	19%
18	Indiana University-Bloomington	$ 1,101,234	53,225	Temple University	$ 4,251,334	100,500	12%	13%
19	Rutgers University-New Brunswick	$ 1,077,418	60,150	DeVry University's Keller Graduate School	$ 3,900,283	49,375	13%	1%
20	University of Pennsylvania	$ 1,033,615	33,300	American InterContinental University-Online	$ 3,735,319	129,850	41%	-3%
21	University of Arizona	$ 983,809	45,975	University of Minnesota-Twin Cities	$ 3,679,264	101,650	7%	18%
22	University of Wisconsin-Madison	$ 981,553	45,050	Michigan State University	$ 3,596,661	99,925	11%	14%
23	Florida State University	$ 976,114	49,125	Rutgers University-New Brunswick	$ 3,436,474	116,925	9%	19%
24	Virginia Commonwealth University	$ 965,668	39,425	Colorado Technical University-Colorado Springs	$ 3,300,070	114,000	47%	1%
25	University of Washington-Seattle	$ 954,589	51,625	Indiana University-Purdue U.-Indianapolis	$ 3,141,584	74,500	15%	10%

Notes: This figure ranks institutions by student loans outstanding in 2000 and 2014. For each year, the first column shows the institution name, the second column shows the total volume of student loans outstanding and the third column shows the number of outstanding borrowers. Dollar values are in thousands of 2014 dollars. 5-Year CDR is the fraction of the 2009 repayment cohort that had defaulted by the 5th year (2014). % Balance repaid is the fraction of the total balance of borrowers who entered in 2009 that had been repaid by 2014 (1-(total balance 2014)/(total balance 2009)). Negative numbers indicate balance has increased. Source: US Treasury tabulations of 4 percent NSLDS sample

Table 6: Median Federal Student Loan Debt in Year Entered Repayment

Fiscal Year	Total	For-Profit	2-Year	Non-Selective	Somewhat Selective	Selective	Graduate Only
1985	$5,282	$4,099	$4,148	$7,430	$7,174	$8,113	$12,393
1986	$4,906	$4,056	$4,095	$7,379	$7,228	$8,018	$12,547
1987	$4,757	$3,906	$3,961	$7,127	$7,330	$8,138	$12,663
1988	$4,520	$3,916	$3,971	$6,267	$7,188	$8,490	$12,485
1989	$5,307	$3,846	$3,859	$6,529	$6,965	$8,826	$13,886
1990	$5,861	$4,458	$4,064	$6,211	$6,924	$9,141	$14,545
1991	$5,650	$4,007	$4,049	$6,119	$6,921	$9,460	$16,557
1992	$6,014	$3,921	$3,946	$6,516	$7,374	$10,417	$16,835
1993	$6,734	$3,841	$4,089	$6,826	$8,101	$11,067	$19,936
1994	$7,292	$4,681	$4,400	$7,122	$8,491	$11,750	$20,235
1995	$8,590	$5,750	$4,891	$8,070	$9,911	$13,224	$22,008
1996	$9,865	$6,304	$5,643	$9,124	$11,772	$15,388	$25,291
1997	$11,462	$6,684	$6,206	$10,504	$14,133	$17,856	$28,909
1998	$12,940	$7,316	$6,628	$12,057	$15,394	$19,358	$30,733
1999	$13,865	$7,402	$7,187	$12,196	$16,764	$20,653	$32,970
2000	$13,942	$7,526	$7,125	$12,812	$16,929	$20,575	$33,272
2001	$14,359	$7,756	$7,150	$13,403	$17,961	$20,536	$34,063
2002	$14,369	$7,534	$7,127	$13,210	$18,167	$20,331	$33,797
2003	$14,235	$7,546	$6,881	$13,084	$18,058	$20,584	$33,670
2004	$13,806	$7,346	$6,709	$13,342	$18,113	$20,527	$32,573
2005	$14,534	$7,416	$7,076	$14,094	$18,363	$20,182	$36,579
2006	$14,714	$7,689	$7,277	$14,963	$18,924	$20,494	$37,370
2007	$13,171	$7,594	$7,212	$14,375	$18,359	$19,847	$34,913
2008	$13,504	$7,775	$7,529	$14,712	$18,186	$19,662	$37,874
2009	$13,587	$8,567	$7,956	$14,850	$18,008	$19,128	$38,176
2010	$14,829	$10,162	$9,379	$17,468	$20,364	$20,585	$41,495
2011	$15,265	$10,482	$9,590	$17,588	$21,816	$22,921	$39,460
2012	$16,883	$11,447	$9,861	$18,851	$23,467	$24,767	$40,945
2013	$18,333	$12,693	$10,435	$20,147	$25,013	$26,459	$42,137
2014	$19,647	$14,255	$11,701	$21,229	$25,886	$26,491	$45,890

Notes: Median total debt burdens of students in the fiscal year required to make first loan payments (generally six months after leaving school) in 2013 dollars. School types defined by the instituion first borrowed to attend. Balances may include both undergraduate and graduate debt. 4-year public and private institutions disaggregated by Barron's index of selectivity (see text). Source: US Treasury tabulations of 4 percent NSLDS sample.

Table 7: Median Debt-Service to Earnings Two Years after Entering Repayment

Fiscal Year	Total	For Profit	2-Year	Non-Selective	Somewhat Selective	Selective	Graduate Only
1999	5%	4%	4%	5%	6%	6%	7%
2000	5%	4%	3%	5%	6%	6%	7%
2001	6%	4%	4%	6%	7%	6%	8%
2002	5%	4%	3%	5%	6%	6%	7%
2003	5%	4%	3%	5%	6%	5%	6%
2004	4%	3%	3%	5%	6%	5%	6%
2005	5%	3%	3%	5%	6%	5%	6%
2006	5%	4%	3%	6%	6%	5%	7%
2007	5%	5%	4%	6%	7%	6%	8%
2008	6%	5%	4%	7%	7%	6%	8%
2009	6%	6%	4%	7%	7%	6%	8%
2010	6%	7%	5%	8%	8%	6%	9%

Notes: This table shows the ratio of debt-service to earnings for borrowers two years after entering repayment. Debt service estimated using 10-year amortizing loan and (weighted average) interest rate on student balances. Institution types defined as the first instituion borrowed to attend. Four-year public and private institutions disaggregated by selectivity data from Barron's (see text). Graduate only borrowers are those who borrow only to attend graduate school. (Other borrowers who start as undergraduate borrowers may subsequently accrue graduate debt.) Source: US Treasury tabulations of 4 percent NSLDS sample matched to de-identified tax records.

Table 8: Alternative Measures of Loan Performance: Negative Amortization and Five-Year Default Rates

Cohort	Owe More 2 Years after Starting Repayment							5-Year Cohort Default Rates						
	All	For-Profit	2-Year	Non-Selective	Some Selective	Selective	Grad	All	For Profit	2-Year	Non-Selective	Some Selective	Selective	Grad
1986	9%	14%	12%	8%	6%	4%	6%	24%	41%	32%	18%	14%	9%	8%
1987	9%	12%	12%	8%	8%	5%	6%	26%	42%	32%	19%	15%	10%	8%
1988	16%	22%	17%	13%	8%	6%	6%	37%	57%	38%	27%	16%	11%	9%
1989	21%	31%	19%	14%	10%	6%	6%	40%	62%	37%	27%	17%	10%	8%
1990	23%	34%	21%	17%	11%	7%	7%	42%	65%	37%	28%	18%	10%	9%
1991	21%	32%	20%	16%	10%	7%	6%	38%	61%	35%	26%	18%	10%	7%
1992	19%	29%	19%	16%	12%	9%	6%	33%	56%	34%	26%	18%	12%	7%
1993	16%	23%	20%	16%	12%	9%	8%	30%	52%	36%	27%	18%	12%	7%
1994	16%	22%	20%	18%	13%	11%	10%	25%	43%	33%	26%	17%	11%	6%
1995	17%	22%	22%	19%	15%	12%	11%	22%	38%	30%	24%	17%	11%	5%
1996	33%	37%	38%	37%	32%	28%	29%	20%	35%	29%	22%	15%	10%	4%
1997	37%	42%	41%	41%	35%	30%	31%	18%	33%	28%	20%	14%	9%	4%
1998	33%	42%	39%	36%	31%	26%	27%	17%	30%	26%	18%	13%	8%	4%
1999	34%	43%	39%	38%	31%	25%	26%	16%	29%	24%	19%	12%	8%	3%
2000	34%	43%	39%	40%	31%	25%	25%	16%	30%	24%	19%	20%	7%	3%
2001	33%	42%	37%	39%	31%	25%	26%	16%	30%	23%	19%	12%	6%	2%
2002	33%	44%	37%	37%	30%	25%	23%	16%	31%	23%	18%	11%	6%	2%
2003	33%	44%	37%	37%	29%	23%	23%	17%	33%	25%	18%	11%	6%	2%
2004	34%	48%	40%	38%	30%	23%	22%	18%	36%	27%	19%	11%	6%	2%
2005	36%	52%	43%	40%	30%	23%	21%	18%	36%	27%	19%	10%	5%	2%
2006	39%	54%	45%	43%	33%	24%	22%	19%	37%	28%	20%	11%	5%	2%
2007	42%	56%	46%	45%	35%	26%	23%	24%	40%	32%	24%	15%	8%	4%
2008	44%	61%	48%	45%	36%	25%	25%	27%	47%	35%	27%	17%	9%	5%
2009	47%	66%	53%	48%	38%	27%	28%	28%	47%	38%	27%	18%	10%	5%
2010	53%	73%	59%	54%	43%	31%	32%							
2011	56%	72%	62%	56%	46%	34%	34%							
2012	57%	74%	64%	59%	48%	36%	36%							

Notes: This table shows the fraction of borrowers who owe more than their initial repayment amount, not he left, an five year cohort default rates, on the right. Selectivity data comes from Barron's rankings and refers to four-year public and private institutions. Cohorts are defined by fiscal year entered repayment. Source: US Treasury tabulations of 4 percent NSLDS sample.

Table 9: Determinants of Default

	(1) Pooled	(2) Pooled	(3) Pooled	(4) 2000	(5) 2011	(6) 2000	(7) 2011
For Profit	0.223***	0.114***	0.096***	0.080***	0.104***	0.075***	0.081***
	(0.0027)	(0.0033)	(0.0039)	(0.0063)	(0.0041)	(0.0070)	(0.0044)
2-Year	0.230***	0.130***	0.122***	0.077***	0.135***	0.072***	0.121***
	(0.0032)	(0.0036)	(0.0041)	(0.0061)	(0.0045)	(0.0065)	(0.0048)
Least Selective	0.137***	0.052***	0.061***	0.045***	0.050***	0.046***	0.062***
	(0.0029)	(0.0032)	(0.0036)	(0.0048)	(0.0041)	(0.0052)	(0.0043)
Somewhat Selective	0.083***	0.010***	0.047***	0.013***	0.008*	0.031***	0.054***
	(0.0024)	(0.0026)	(0.0031)	(0.0038)	(0.0035)	(0.0044)	(0.0038)
Selective	0.033***	-0.025***	0.032***	-0.016***	-0.030***	0.017***	0.040***
	(0.0022)	(0.0025)	(0.0029)	(0.0036)	(0.0033)	(0.0041)	(0.0037)
Graduate Student		-0.095***	-0.029***	-0.061***	-0.113***	-0.017***	-0.034***
		(0.0022)	(0.0025)	(0.0034)	(0.0028)	(0.0038)	(0.0030)
Dependent Student		-0.021***	-0.017***	0.005	-0.026***	0.006	-0.023***
		(0.0034)	(0.0032)	(0.0056)	(0.0042)	(0.0051)	(0.0039)
Family Income		-0.007***	-0.005***	-0.006***	-0.008***	-0.005***	-0.006***
		(0.0003)	(0.0004)	(0.0005)	(0.0004)	(0.0006)	(0.0005)
Ind. Family Income		-0.003***	0.001**	-0.001	-0.004***	0.002	0.002***
		(0.0006)	(0.0005)	(0.0013)	(0.0007)	(0.0010)	(0.0005)
Age		-0.001***	-0.001***	-0.001**	-0.001***	-0.002***	-0.001***
		(0.0001)	(0.0001)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
Debt/Earnings			0.082***			0.086***	0.075***
			(0.0063)			(0.0107)	(0.0051)
Earnings			-0.005***			-0.003*	-0.006***
			(0.0011)			(0.0014)	(0.0004)
Duration			-0.030***			-0.023***	-0.031***
			(0.0010)			(0.0017)	(0.0012)
Married			-0.093***			-0.081***	-0.092***
			(0.0020)			(0.0030)	(0.0025)
Dropout			0.076***			0.044***	0.094***
			(0.0041)			(0.0084)	(0.0047)
R-squared	0.050	0.072	0.154	0.045	0.073	0.120	0.161
Observations	161,361	161,329	161,329	43,708	117,621	43,708	117,621

Notes: *p < :1, ** p < :05, *** p < :01. This table presents results from a linear probability model. The dependent variable is an indicator of whether or not a loan defaults within three years of repayment. A loan is in default if a payment is more than 270 days overdue. The sample is restricted to individuals who took out student loans in the survey sample period. Additional sample restrictions are given in the header above each column. Graduate student refers to borrowers who took out loans for gradaute school. Family income refers to independent student's family income recoraded on the FAFSA. Duration refers to the years between repayment beginning and first borrowing. No earnings is an indicator of earnings being equal to zero or missing. Dropout defers to whether an individual completed an AA or a BA condition on enrolling in a 2 or 4 year institution. Age refers to the age when an individual entered repayment. Married and has children refer to filing status and and number of dependnet children on tax forms. Dollar amounts are in $10,000. Debt service estimated using 10-year amortizing loan and (weighted average) interest rate on student balances. Four-year public and private institutions disaggregated by selectivity data from Barron's (see text). Huber-White robust standard errors in parentheses. The excluded school type category is graduate only borrowers. Source: 4 percent NSLDS sample matched to de-identified tax records.

Table 10: Decomposition

	Full Sample	Full Sample	Full Sample	For Profit	2-Year	Non-Selective	Somewhat Selective	Selective	Graduate Only
2000	0.097	0.097	0.097	0.176	0.182	0.118	0.087	0.049	0.016
2011	0.185	0.185	0.185	0.246	0.305	0.167	0.121	0.071	0.027
Difference	-0.088	-0.088	-0.088	-0.070	-0.123	-0.050	-0.035	-0.022	-0.012
Endowments	-0.039	-0.029	-0.050	-0.030	-0.037	-0.011	0.004	0.010	-0.001
Background		-0.001	-0.004	-0.002	0.004	0.011	0.004	0.001	0.001
Labor Market			-0.025	-0.029	-0.039	-0.026	-0.003	-0.003	0.000
Earnings			-0.023	-0.022	-0.035	-0.024	-0.003	-0.003	0.000
Other			-0.004	0.006	-0.004	0.009	-0.001	0.002	0.001
Loan			-0.016	0.001	-0.009	-0.041	-0.003	-0.005	0.001
Education			0.009	-0.007	0.010	0.034	0.007	0.014	-0.003
Duration			-0.004	0.003	-0.002	0.002	0.001	0.000	0.000
School Type	-0.039	-0.031	-0.010						

Notes: $*p < .1$, $** p < .05$, $*** p < .01$. The first row shows the 2001 three year cohort default rates. The second row shows the 2011 three year cohort default rate. The third row shows the difference betwen the 2001 and 2011 default rates. The change due to endowments is the difference between simulated 2000 default rate using the counterfactual distribution of observables from the 2011 sample and the observed 2011 default rate. The change due to total amount borrowed and income is the difference between the observed 2000 default rate and the default rate simulated if the individual variable were distributed according to the 2011 distribution and other variables remained unchanged. The change due to other student characteristics is given by the total change less the change due to income, total amount borrowed and school type. The total amount borrowed is the total amount of loans the individual borrowed. Individuals who are not working and do not earn any income are coded as zero. Income is defined as the average amount earned by each borrower. All dollar amounts are measured in 2013 US dollars. The sample is restricted to individuals who took out student loans in the survey sample period. Other labor market includes earnings and no earnings. Loan includes balance, debt service and the debt earnings ratio. Education includes duration, completion and dropout status. Background includes family income broken down by dependency status, age, and dependency status. Education includes attainment of a BA, attainment of an AA, dropout status and duration. Other includes marital status, number of dependent children, EFC, and whether a Pell grant was ever received. Additional sample restrictions are given in the header above each column. Four-year public and private institutions disaggregated by selectivity data from Barron's (see text). Source: 4 percent NSLDS sample matched to de-identified tax records.

Table 11: Estimates of the Distribution of Debt and Income (2013)

By Quintile of National Distribution of:	Median Loan Balance	Median Borrower Earnings	Median Borrower Income	Median Parent Income	Share of Borrowers	Share of Total Debt
Federal Student Debt						
Bottom 20 Percent	2,470	20,506	29,387	49,846	20.0	2.0
20th-40th	6,712	22,140	31,491	53,980	20.0	5.6
40th-60th	12,498	26,405	36,379	57,058	20.0	10.6
60th-80th	23,565	32,658	43,863	58,227	20.0	20.1
Top 20 Percent	57,528	42,367	57,213	54,041	20.0	61.8
Total Income (Tax unit: AGI excluding adjustments)						
Bottom 20 Percent	9,012	0	394	35,295	20.8	15.2
20th-40th	10,180	17,545	18,719	42,213	14.4	10.6
40th-60th	12,193	31,059	32,874	52,447	17.5	15.5
60th-80th	14,747	47,541	56,529	61,848	21.6	23.9
Top 20 Percent	17,637	67,044	113,603	70,261	25.8	34.9
Earnings (Individual)						
Bottom 20 Percent	9,352	0	0	40,176	16.4	12.9
20th-40th	9,885	8,637	12,775	41,073	19.8	14.7
40th-60th	11,250	24,468	26,669	50,851	18.4	14.9
60th-80th	14,670	41,204	45,551	61,563	20.5	21.2
Top 20 Percent	18,914	75,087	96,218	68,995	25.0	36.3

Note: The table examines the disribution of Federal student debt across three dimensions. Each panel divides the borrowing population in 2013 with outstanding federal loans who are in repayment on those loans at least one year along the dimensions described below and provides median values for each statistic and the share of borrowers and loan amounts within each subgroup. The top panel divides the population of borrowers into five equal groups (quintiles) based on the amount of debt of each borrower. The middle panel assignes borrowers to National income quintiles based on their income and the distribution of income for the 2013 population, including non-filers (adjusted to mirror the age distribution of student-loan borrowers): 20th percentile $12,659; 40th $24,888; 60th $42,009; 80th $76,633. The bottom panel assigns borrowers to earnings quintiles based on the distribution of earnings (including those with no earnings) for the age- and gender-adjusted population based on the Annual Social and Economic Suppliment of the Current Population Survey (2013). Thresholds are: 20th $0; 40th $16,978; 40th $32,046; 80th $52402. Dollar values in 2013 dollars. Source: Treasury tabulations of NSLDS 4 percent sample matched to de-identified tax records.

Table 12: Characteristics of Borrowers with Large Balances

	All Borrowers		Borrowers Entering Repayment	
	2000	2014	2000	2014
Among all borrowers:				
Share of borrowers with balances over $50k	5.1%	13.7%	8.9%	18.4%
Share of undergraduate balances over $50k	1.3%	6.2%	2.3%	9.1%
Share of graduate balances over $50k	20.6%	33.8%	29.9%	42.4%
Share of Parent Plus balances over $50k	3.4%	13.1%	4.3%	25.4%
Share of borrowers with balances over $100k	1.0%	4.1%	1.9%	5.7%
Share of graduate balances over $100k	5.3%	14.5%	8.1%	19.7%
Share of Parent Plus balances over $100k	0.4%	3.7%	0.4%	8.8%
Among borrowers with balances >$50,000:				
Fraction of Loan Balances by Loan Type				
Undergraduate Loans	28%	37%	25%	37%
Graduate Loans	68%	55%	69%	50%
Parent PLUS Loans	5%	8%	6%	13%
Fraction of Borrowers by Type				
Undergraduate Only	18%	29%	17%	32%
Graduate Only	27%	14%	29%	11%
Both Undergraduate and Graduate	49%	47%	45%	40%
Parent PLUS Borrower	6%	10%	8%	16%
Institution Type of Last Borrowing (undergraduate and graduate borrowers only)				
For-profit	2%	11%	2%	15%
2-year Public/Private	1%	3%	0%	4%
Non-selective 4-year Public/Private	5%	8%	5%	9%
Somewhat selective 4-year Public/Private	7%	11%	8%	11%
Selective 4-year Public/Private	6%	5%	7%	5%
Graduate School	80%	62%	77%	57%
Fraction of Graduate Borrowers by Type of Program:				
For-Profit	5%	15%	3%	21%
Public	38%	36%	39%	35%
Private	57%	48%	58%	44%
Labor Market Outcomes				
Average Earnings	$ 54,802	$ 56,339		
Median Earnings	$ 41,731	$ 41,906		
Average Total Income	$ 69,071	$ 68,247		
Median Total Income	$ 48,575	$ 46,530		
Non-employment	12.3%	14.6%		

Note: Selectivity from Barron's (see text). Graduate only refers to borrowers who started borrowing at the graduate level. Dollar values in 2013 dollars. Source: Treasury tabulations of NSLDS 4 percent sample matched to de-identified tax records.